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Ongoing Face Recognition Vendor Test (FRVT)

Part 1: Verification

Patrick Grother
Mei Ngan
Kayee Hanaoka
Information Access Division
Information Technology Laboratory

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DISCLAIMER

Specific hardware and software products identified in this report were used in order to perform the evaluations described in this document. In no case does identification of any commercial product, trade name, or vendor, imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the products and equipment identified are necessarily the best available for the purpose.

INSTITUTIONAL REVIEW BOARD

The National Institute of Standards and Technology's Research Protections Office reviewed the protocol for this project and determined it is not human subjects research as defined in Department of Commerce Regulations, 15 CFR 27, also known as the Common Rule for the Protection of Human Subjects (45 CFR 46, Subpart A).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

FRVT STATUS

This report is a draft NIST Interagency Report, and is open for comment. It is the seventeenth edition of the report since the first was published in June 2017. Prior editions of this report are maintained on the FRVT website, and may contain useful information about older algorithms and datasets no longer used in FRVT.

FRVT remains open: All four tracks of the FRVT are open to new algorithm submissions.

Changes since May 18, 2020:

- ▷ The report is the first FRVT update since the pandemic closed it from March to June 2020.
- ▷ This report includes results for algorithms from nine new developers: GeoVision Inc, Su Zhou NaZhi-TianDi Intelligent Technology, YooniK, AYF Technology, PXL Vision AG, Yuan High-Tech Development, Beihang University-ERCACAT, ICM Airport Technics, and Staqu Technologies
- ▷ This report includes results for algorithms from 15 returning developers Acer Incorporated, Antheus Technologia, Chosun University, Chunghwa Telecom, Idemia, Moontime Smart Technology, Neurotechnology, Guangzhou Pixel Solutions, Panasonic R+D Center Singapore, Rank One Computing, Scanovate, Shanghai Universiy - Shanghai Film Academy, Synesis, Trueface.ai, and Veridas Digital Authentication Solutions
- ▷ We have retired results for ten algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.
- ▷ We separated timing and other resource consumption from the main participation table. The new Table **??** includes template generation durations for four kinds of images, not just mugshots.
- ▷ We have published a separate report, NIST Interagency Report 8311 on accuracy of pre-pandemic algorithms on subjects wearing face masks. We plan to track improvements in accuracy on masked images going forward. In particular, we invite submission of algorithms that can detect whether a person is wearing a mask, extract features from the full face or the exposed periocular region, and do appropriate comparison. We do not intend to evaluate algorithms that assume 100% of images will be of masked individuals.

Changes since March 25, 2020:

- ▷ The report is a maintenance release - it does not add any new algorithms, and FRVT has been closed to new algorithms since mid March 2020.
- ▷ We modified the primary accuracy summary, Table 16, as follows:
  - ▷▷ For visa images, the column for FNMR at FMR = 0.0001 has been removed. The visa images are so highly controlled that the error rates for the most accurate algorithms are dominated by false rejection of very young children and by the presence of a few noisy greyscale images. For now, two visa columns remain: FNMR at FMR= 10^{-6} and, for matched covariates, FNMR at FMR= 10^{-4}.
  - ▷▷ We have inserted a new column labelled "BORDER" giving accuracy for comparison of moderately poor webcam border-crossing photos that exhibit pose variations, poor compression, and low contrast due to strong background illumination. The accuracies are the worst from all cooperative image datasets used in FRVT.
- ▷ Accordingly, we updated the failure-to-template rates in Table 20.
- ▷ We withdrew a figure showing how false matches are concentrated in certain visa images used in cross-comparison, because it didn't attempt to include demographic information.

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Changes since February 27, 2020:

- The report adds results algorithms from two new developers: Beijing Alleyes Technology, and the Chinese Univeristy of Hong Kong. Results for newly submitted algorithms from two other developers will appear in the next report.
- The report adds results for algorithms from thirteen returning developers: ASUSTek Computer, Aware, Cyberlink Corp, Gorilla Technology, Innovative Technology, Kakao Enterprise, Lomonosov Moscow State University, Panasonic R+D Center Singapore, Shenzhen AiMall Technology, Shenzhen Intellifusion Technologies, Synology, Tech5 SA, and Via Technologies.
- Per policy to only list results for two algorithms per developer, we have dropped results for algorithms from Aware, Cyberlink, Gorilla Technology, Kakao Enterprise, Lomonosov Moscow State University, Panasonic R+D Center Singapore, and Tech5 SA.

Changes since January 20, 2020:

- The report adds results for five new developers: Ability Enterprise (Andro Video), Chosun University, Fujitsu Research and Development Center, University of Coimbra, and Xforward AI Technology.
- The report adds results for algorithms from six returning developers: AlphaSSTG, Incode Technologies, Kneron. Shanghai Jiao Tong University, Vocord, and X-Laboratory.
- We have corrected template comparison timing numbers for algorithms submitted September 2019 to January 2020. The values reported previously were slower due to a software bug.
- We have dropped results for algorithms from Vocord and Incode per policy to only list results for two algorithms per developer.
- The FRVT 1:1 homepage has been updated with latest accuracy results.
- The FRVT 1:N homepage now includes an update to the September 2019 NIST Interagency Report 8271. The new report adds results for one-to-many search algorithms submitted to NIST from June 2019 to January 2020.

Changes since January 6, 2020:

- Section 2 has been updated to better describe the Visa and Border images. The caption for Table 16 has been updated to better relate the accuracy values to particular image comparisons.
- The report adds results for five new developers: Acer, Advance.AI, Expasoft, Netbridge Technology, and Videmo Intelligente Videoanalyse.
- The report adds results for algorithms from 7 returning developers: China Electronics Import-Export Corp, Intel Research Group, ITMO University, Neurotechnology, N-Tech Lab, Rokid, and VisionLabs.
- We have dropped results from this edition of the report per policy to only list results for two algorithms per developer: N-Tech Lab, Neurotechnology, ITMO, Visionlabs, and CEIEC.
- The FRVT homepage has been updated with latest accuracy results.

Changes since November 11, 2019:

- ▷ Table 10 has been updated to include runtime memory usage. This is the first time such a quantity has been reported. The value is the peak size of the resident set size logged during enrollment of single images.
- ▷ We have migrated summary results table to a new platform that supports sortable tables: https://pages.nist.gov/frvt/html/frvt11.html
- ▷ The report adds results for four new developers: Antheus Technologia, BioID Technologies SA, Canon Information Tech. (Beijing), Samsung S1 (listed in the tables as S1), and Taiwan AI Labs.
- ▷ The report adds results for algorithms from 13 returning developers: Anke Investments, Chunghwa Telecom, Deepglint, Institute of Information Technologies, iQIYI, Kneron, Ping An Technology, Paravision, KanKan Ai, Rokid Corporation, Shanghai Universiy - Shanghai Film Academy, Veridas Digital Authentication Solutions, and Videonetics Technology.
- ▷ We have dropped results from this edition of the report per policy to only list results for two algorithms per developer: remarkai-000, veridas-001, sensetime-001, iit-000, anke-003, and everai-002. Results for these are available in prior editions of this report linked from the FRVT page.
- ▷ We issued NIST Interagency Report 8280: FRVT Part 3: Demographics on 2019-12-19. It includes results for many of the algorithms covered by this report.

Changes since October 16, 2019:

- ▷ The report adds results for ten new developers: Ai-Union Technology, ASUSTek Computer, DiDi ChuXing Technology, Innovative Technology, Luxand, MVision, Pyramid Cyber Security + Forensic, Scanovate, Shenzhen AiMall Tech, and TUPU Technology.
- ▷ The report adds results for 12 returning developers: CTBC Bank Glory Gorilla Technology Guangzhou Pixel Solutions Imagus Technology Incode Technologies Lomonosov Moscow State University Rank One Computing Samtech InfoNet Shanghai Ulucu Electronics Technology Synesis, and Winsense.
- ▷ We have dropped results from this edition of the report per policy to only list results for two algorithms per developer: glory-000, gorilla-002, incode-003, rankone-006, and synesis-004.
- ▷ Results for five recently submitted algorithms will appear in the next report.

Changes since September 11, 2019:

- ▷ The report adds results for five new participants: Awidit Systems (Awiros), Momemtum Digital (Sertis), Trueface AI, Shanghai Jiao Tong University, and X-Laboratory.
- ▷ The reports adds results for five new algorithms from returning developers: Cyberlink, Hengrui AI Technology, Idemia, Panasonic R+D Singapore, and Tevian. This causes three algorithm, to be de-listed from the report per policy to list results for two algorithms per developer.

Changes since July 31 2019:

- ▷ The HTML table on the FRVT 1:1 homepage has been updated to include a column for cross-domain Visa-Border verification. Results for this new dataset appeared in the July 29 report under the name "CrossEV" - these are now renamed "Visa-Border".
- ▷ The FRVT 1:1 homepage lists algorithms according to lowest mean rank accuracy:

  Rank($FNMR_{VISA}$ at FMR = 0.000001) +
  Rank($FNMR_{VISA\text{-}BORDER}$ at FMR = 0.000001) +
  Rank($FNMR_{MUGSHOT}$ at FMR = 0.00001 after 14 years) +
  Rank($FNMR_{WILD}$ at FMR = 0.00001)

  This ordering rewards high accuracy across all datasets.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- ▷ The main results in Table 16 is now in landscape format to accomodate extra columns for the Visa-Border set, and mugshot comparisons after at least 12 years.
- ▷ The report adds results for nine new participants: Alpha SSTG, Intel Research, ULSee, Chungwa Telecon, iSAP Solution, Rokid, Shenzhen EI Networks, CSA Intellicloud, Shenzhen Intellifusion Technologies.
- ▷ The reports adds results for six new algorithms from returning developers: Innovatrics, Dahua Technology, Tech5 SA, Intellivision, Nodeflux and Imperial College, London. One algorithm, from Imperial has been retired, per policy to list results for two algorithms per developer.
- ▷ The cross-country false match rate heatmaps starting from Figure 414 have been replotted to reveal more structure by listing countries by region instead of alphabetically.
- ▷ The next version of this report will be posted around October 18, 2019.

Changes since July 3 2019:

- ▷ The HTML table on the FRVT 1:1 homepage has been updated to list the 20 most accurate developers rather than algorithms, choosing the most accurate algorithm from each developer based on visa and mugshot results. Also, the algorithms are ordered in terms of lowest mean rank across mugshot, visa and wild datasets, rewarding broad accuracy over a good result on one particular dataset.
- ▷ This report includes results for a new dataset - see the column labelled "visa-border" in Table 5. It compares a new set of high quality visa-like portraits with a set webcam border-crossing photos that exhibit moderately poor pose variations and background illumination. The two new sets are described in sections 2.3 and 2.4. The comparisons are "cross-domain" in that the algorithm must compare "visa" and "wild" images. Results for other algorithms will be added in future reports as they become available.
- ▷ This report adds results for algorithms from 9 developers submitted in early July 2019. These are from 3DiVi, Camvi, EverAI-Paravision, Facesoft, Farbar (F8), Institute of Information Technologies, Shanghai U. Film Academy, Via Technologies, and Ulucu Electronics Tech. Six of these are new participants.
- ▷ Several other algorithms have been submitted and are being evaluated. Results will be released in the next report, scheduled for September 5. That report will include results for new datasets.
- ▷ Older algorithms from Everai, Camvi and 3DiVi, have been retired, per the policy to list only two algorithms per developer.

Changes since June 20 2019:

- ▷ This report adds results for algorithms from 18 developers submitted in early June 2019. These are from CTBC Bank, Deep Glint, Thales Cogent, Ever AI Paravision, Gorilla Technology, Imagus, Incode, Kneron, N-Tech Lab, Neurotechnology, Notiontag Technologies, Star Hybrid, Videonetics, Vigilant Solutions, Winsense, Anke Investments, CEIEC, and DSK. Nine of these are new participants.
- ▷ Several other algorithms have been submitted and are being evaluated. Results will be released in the next report, scheduled for August 1.
- ▷ Older algorithms from Everai, Thales Cogent, Gorilla Technology, Incode, Neurotechnology, N-Tech Lab and Vigilant Solutions have been retired, per the policy to list only two algorithms per developer.

Changes since April 2019:

- ▷ This report adds results for nine algorithms from nine developers submitted in early June 2019. These are from Tencent Deepsea, Hengrui, Kedacom, Moontime, Guangzhou Pixel, Rank One Computing, Synesis, Sensetime and Vocord.
- ▷ Another 23 algorithms have been submitted and are being evaluated. Results will be released in the next report, scheduled for July 3.

- ▷ Older algorithms for Rank One, Synesis, and Vocord have been retired, per the policy to list only two algorithms per developer.

Changes since February 2019:

- ▷ This report adds results for 49 algorithms from 42 developers submitted in early March 2019.
- ▷ This report omits results for algorithms that we retired. We retired for three reasons: 1. The developer submitted a new algorithm, and we only list two. 2. The algorithm needs a GPU, and we no longer allow GPU-based algorithms. 3. Inoperable algorithms.
- ▷ Previous results for retired algorithms are available in older editions of this report linked here.
- ▷ The mugshot database used from February 2017 to January 2019 has been replaced with an extract of the mugshot database documented in NIST Interagency Report 8238, November 2018. The new mugshot set is described in section 2.5 and is adopted because:
  - ▷▷ It has much better identity label integrity, so that false non-match rates are substantially lower than those reported in FRVT 1:1 reports to date - see Figure 46.
  - ▷▷ It includes images collected over a 17 year period such that ageing can be much better characterized - - see Figure 173.
- ▷ Using the new mugshot database, Figure 173 shows accuracy for four demographic groups identified in the biographic metadata that accompanies the data: black females, black males, white females and white males.
- ▷ The report adds Figure 13 with results for the twenty human-difficult pairs used in the May 2018 paper *Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms* by Phillips et al. [1].
- ▷ The report uses an update to the wild image database that corrects some ground truth labels.
- ▷ Some results for the child exploitation database are not complete. They are typically updated less frequently than for other image sets.

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FNMR(T) "False non-match rate"
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510 ALGORITHM INTELLIVISION-002 CROSS COUNTRY FMR . . . 565
511 ALGORITHM INTELRESEARCH-000 CROSS COUNTRY FMR . . . 566
512 ALGORITHM INTSYSMSU-001 CROSS COUNTRY FMR . . . 567
513 ALGORITHM IQFACE-000 CROSS COUNTRY FMR . . . 568
514 ALGORITHM IQFACE-001 CROSS COUNTRY FMR . . . 569
515 ALGORITHM ISAP-001 CROSS COUNTRY FMR . . . 570
516 ALGORITHM ISITYOU-000 CROSS COUNTRY FMR . . . 571
517 ALGORITHM ISYSTEMS-001 CROSS COUNTRY FMR . . . 572
518 ALGORITHM ISYSTEMS-002 CROSS COUNTRY FMR . . . 573
519 ALGORITHM ITMO-006 CROSS COUNTRY FMR . . . 574
520 ALGORITHM ITMO-007 CROSS COUNTRY FMR . . . 575
521 ALGORITHM KAKAO-002 CROSS COUNTRY FMR . . . 576
522 ALGORITHM KEDACOM-000 CROSS COUNTRY FMR . . . 577
523 ALGORITHM KNERON-003 CROSS COUNTRY FMR . . . 578
524 ALGORITHM KNERON-005 CROSS COUNTRY FMR . . . 579
525 ALGORITHM LOOKMAN-002 CROSS COUNTRY FMR . . . 580
526 ALGORITHM LOOKMAN-004 CROSS COUNTRY FMR . . . 581
527 ALGORITHM LUXAND-000 CROSS COUNTRY FMR . . . 582
528 ALGORITHM MEGVII-001 CROSS COUNTRY FMR . . . 583
529 ALGORITHM MEGVII-002 CROSS COUNTRY FMR . . . 584
530 ALGORITHM MEIYA-001 CROSS COUNTRY FMR . . . 585
531 ALGORITHM MICROFOCUS-001 CROSS COUNTRY FMR . . . 586
532 ALGORITHM MICROFOCUS-002 CROSS COUNTRY FMR . . . 587
533 ALGORITHM MT-000 CROSS COUNTRY FMR . . . 588
534 ALGORITHM MT-002 CROSS COUNTRY FMR . . . 589
535 ALGORITHM MVISION-001 CROSS COUNTRY FMR . . . 590
536 ALGORITHM NAZHIAI-000 CROSS COUNTRY FMR . . . 591
537 ALGORITHM NETBRIDGETECH-001 CROSS COUNTRY FMR . . . 592
538 ALGORITHM NEUROTECHNOLOGY-008 CROSS COUNTRY FMR . . . 593
539 ALGORITHM NEUROTECHNOLOGY-009 CROSS COUNTRY FMR . . . 594
540 ALGORITHM NODEFLUX-002 CROSS COUNTRY FMR . . . 595
541 ALGORITHM NOTIONTAG-000 CROSS COUNTRY FMR . . . 596
542 ALGORITHM NTECHLAB-007 CROSS COUNTRY FMR . . . 597
543 ALGORITHM PARAVISION-004 CROSS COUNTRY FMR . . . 598
544 ALGORITHM PIXELALL-003 CROSS COUNTRY FMR . . . 599
545 ALGORITHM PIXELALL-004 CROSS COUNTRY FMR . . . 600
546 ALGORITHM PSL-003 CROSS COUNTRY FMR . . . 601
547 ALGORITHM PSL-005 CROSS COUNTRY FMR . . . 602
548 ALGORITHM PXL-001 CROSS COUNTRY FMR . . . 603
549 ALGORITHM PYRAMID-000 CROSS COUNTRY FMR . . . 604
550 ALGORITHM RANKONE-008 CROSS COUNTRY FMR . . . 605
551 ALGORITHM RANKONE-009 CROSS COUNTRY FMR . . . 606
552 ALGORITHM REALNETWORKS-002 CROSS COUNTRY FMR . . . 607
553 ALGORITHM REALNETWORKS-003 CROSS COUNTRY FMR . . . 608
554 ALGORITHM REMARKAI-001 CROSS COUNTRY FMR . . . 609
555 ALGORITHM REMARKAI-002 CROSS COUNTRY FMR . . . 610
556 ALGORITHM ROKID-000 CROSS COUNTRY FMR . . . 611
557 ALGORITHM ROKID-001 CROSS COUNTRY FMR . . . 612
558 ALGORITHM S1-001 CROSS COUNTRY FMR . . . 613

559 ALGORITHM SAFFE-001 CROSS COUNTRY FMR . . . 614
560 ALGORITHM SAFFE-002 CROSS COUNTRY FMR . . . 615
561 ALGORITHM SAMTECH-001 CROSS COUNTRY FMR . . . 616
562 ALGORITHM SCANOVATE-001 CROSS COUNTRY FMR . . . 617
563 ALGORITHM SCANOVATE-002 CROSS COUNTRY FMR . . . 618
564 ALGORITHM SENSETIME-002 CROSS COUNTRY FMR . . . 619
565 ALGORITHM SENSETIME-003 CROSS COUNTRY FMR . . . 620
566 ALGORITHM SERTIS-000 CROSS COUNTRY FMR . . . 621
567 ALGORITHM SHAMAN-000 CROSS COUNTRY FMR . . . 622
568 ALGORITHM SHAMAN-001 CROSS COUNTRY FMR . . . 623
569 ALGORITHM SHU-002 CROSS COUNTRY FMR . . . 624
570 ALGORITHM SHU-003 CROSS COUNTRY FMR . . . 625
571 ALGORITHM SIAT-002 CROSS COUNTRY FMR . . . 626
572 ALGORITHM SIAT-004 CROSS COUNTRY FMR . . . 627
573 ALGORITHM SJTU-001 CROSS COUNTRY FMR . . . 628
574 ALGORITHM SJTU-002 CROSS COUNTRY FMR . . . 629
575 ALGORITHM SMILART-002 CROSS COUNTRY FMR . . . 630
576 ALGORITHM SMILART-003 CROSS COUNTRY FMR . . . 631
577 ALGORITHM STAQU-000 CROSS COUNTRY FMR . . . 632
578 ALGORITHM STARHYBRID-001 CROSS COUNTRY FMR . . . 633
579 ALGORITHM SYNESIS-006 CROSS COUNTRY FMR . . . 634
580 ALGORITHM SYNESIS-007 CROSS COUNTRY FMR . . . 635
581 ALGORITHM SYNOLOGY-000 CROSS COUNTRY FMR . . . 636
582 ALGORITHM SYNOLOGY-001 CROSS COUNTRY FMR . . . 637
583 ALGORITHM TECH5-003 CROSS COUNTRY FMR . . . 638
584 ALGORITHM TECH5-004 CROSS COUNTRY FMR . . . 639
585 ALGORITHM TEVIAN-004 CROSS COUNTRY FMR . . . 640
586 ALGORITHM TEVIAN-005 CROSS COUNTRY FMR . . . 641
587 ALGORITHM TIGER-002 CROSS COUNTRY FMR . . . 642
588 ALGORITHM TIGER-003 CROSS COUNTRY FMR . . . 643
589 ALGORITHM TONGYI-005 CROSS COUNTRY FMR . . . 644
590 ALGORITHM TOSHIBA-002 CROSS COUNTRY FMR . . . 645
591 ALGORITHM TOSHIBA-003 CROSS COUNTRY FMR . . . 646
592 ALGORITHM TRUEFACE-000 CROSS COUNTRY FMR . . . 647
593 ALGORITHM TRUEFACE-001 CROSS COUNTRY FMR . . . 648
594 ALGORITHM TUPUTECH-000 CROSS COUNTRY FMR . . . 649
595 ALGORITHM ULSEE-001 CROSS COUNTRY FMR . . . 650
596 ALGORITHM ULUFACE-002 CROSS COUNTRY FMR . . . 651
597 ALGORITHM ULUFACE-003 CROSS COUNTRY FMR . . . 652
598 ALGORITHM UPC-001 CROSS COUNTRY FMR . . . 653
599 ALGORITHM VCOG-002 CROSS COUNTRY FMR . . . 654
600 ALGORITHM VD-001 CROSS COUNTRY FMR . . . 655
601 ALGORITHM VERIDAS-003 CROSS COUNTRY FMR . . . 656
602 ALGORITHM VERIDAS-004 CROSS COUNTRY FMR . . . 657
603 ALGORITHM VIA-000 CROSS COUNTRY FMR . . . 658
604 ALGORITHM VIA-001 CROSS COUNTRY FMR . . . 659
605 ALGORITHM VIDEONETICS-001 CROSS COUNTRY FMR . . . 660
606 ALGORITHM VIDEONETICS-002 CROSS COUNTRY FMR . . . 661
607 ALGORITHM VIGILANTSOLUTIONS-006 CROSS COUNTRY FMR . . . 662
608 ALGORITHM VIGILANTSOLUTIONS-007 CROSS COUNTRY FMR . . . 663
609 ALGORITHM VION-000 CROSS COUNTRY FMR . . . 664
610 ALGORITHM VISIONBOX-000 CROSS COUNTRY FMR . . . 665
611 ALGORITHM VISIONBOX-001 CROSS COUNTRY FMR . . . 666
612 ALGORITHM VISIONLABS-007 CROSS COUNTRY FMR . . . 667
613 ALGORITHM VISTEAM-000 CROSS COUNTRY FMR . . . 668
614 ALGORITHM VOCORD-007 CROSS COUNTRY FMR . . . 669

615 ALGORITHM VOCORD-008 CROSS COUNTRY FMR . . . 670
616 ALGORITHM WINSENSE-000 CROSS COUNTRY FMR . . . 671
617 ALGORITHM WINSENSE-001 CROSS COUNTRY FMR . . . 672
618 ALGORITHM X-LABORATORY-000 CROSS COUNTRY FMR . . . 673
619 ALGORITHM X-LABORATORY-001 CROSS COUNTRY FMR . . . 674
620 ALGORITHM XFORWARDAI-000 CROSS COUNTRY FMR . . . 675
621 ALGORITHM YISHENG-004 CROSS COUNTRY FMR . . . 676
622 ALGORITHM YITU-003 CROSS COUNTRY FMR . . . 677
623 ALGORITHM YOONIK-000 CROSS COUNTRY FMR . . . 678
624 ALGORITHM YUAN-000 CROSS COUNTRY FMR . . . 679
625 IMPOSTOR COUNTS FOR CROSS COUNTRY FMR CALCULATIONS . . . 680
626 ALGORITHM 3DIVI-003 CROSS AGE FMR . . . 682
627 ALGORITHM 3DIVI-004 CROSS AGE FMR . . . 683
628 ALGORITHM ACER-000 CROSS AGE FMR . . . 684
629 ALGORITHM ACER-001 CROSS AGE FMR . . . 685
630 ALGORITHM ADERA-001 CROSS AGE FMR . . . 686
631 ALGORITHM ADVANCE-002 CROSS AGE FMR . . . 687
632 ALGORITHM AIFIRST-001 CROSS AGE FMR . . . 688
633 ALGORITHM AILABS-001 CROSS AGE FMR . . . 689
634 ALGORITHM AIMALL-001 CROSS AGE FMR . . . 690
635 ALGORITHM AIMALL-002 CROSS AGE FMR . . . 691
636 ALGORITHM AIUNIONFACE-000 CROSS AGE FMR . . . 692
637 ALGORITHM ALCHERA-000 CROSS AGE FMR . . . 693
638 ALGORITHM ALCHERA-001 CROSS AGE FMR . . . 694
639 ALGORITHM ALLEYES-000 CROSS AGE FMR . . . 695
640 ALGORITHM ALLGOVISION-000 CROSS AGE FMR . . . 696
641 ALGORITHM ALPHAFACE-001 CROSS AGE FMR . . . 697
642 ALGORITHM ALPHAFACE-002 CROSS AGE FMR . . . 698
643 ALGORITHM AMPLIFIEDGROUP-001 CROSS AGE FMR . . . 699
644 ALGORITHM ANDROVIDEO-000 CROSS AGE FMR . . . 700
645 ALGORITHM ANKE-004 CROSS AGE FMR . . . 701
646 ALGORITHM ANKE-005 CROSS AGE FMR . . . 702
647 ALGORITHM ANTHEUS-000 CROSS AGE FMR . . . 703
648 ALGORITHM ANTHEUS-001 CROSS AGE FMR . . . 704
649 ALGORITHM ANYVISION-002 CROSS AGE FMR . . . 705
650 ALGORITHM ANYVISION-004 CROSS AGE FMR . . . 706
651 ALGORITHM ASUSAICS-000 CROSS AGE FMR . . . 707
652 ALGORITHM ASUSAICS-001 CROSS AGE FMR . . . 708
653 ALGORITHM AWARE-004 CROSS AGE FMR . . . 709
654 ALGORITHM AWARE-005 CROSS AGE FMR . . . 710
655 ALGORITHM AWIROS-001 CROSS AGE FMR . . . 711
656 ALGORITHM AYFTECH-001 CROSS AGE FMR . . . 712
657 ALGORITHM AYONIX-000 CROSS AGE FMR . . . 713
658 ALGORITHM BIOIDTECHSWISS-000 CROSS AGE FMR . . . 714
659 ALGORITHM BM-001 CROSS AGE FMR . . . 715
660 ALGORITHM CAMVI-002 CROSS AGE FMR . . . 716
661 ALGORITHM CAMVI-004 CROSS AGE FMR . . . 717
662 ALGORITHM CEIEC-002 CROSS AGE FMR . . . 718
663 ALGORITHM CEIEC-003 CROSS AGE FMR . . . 719
664 ALGORITHM CHOSUN-000 CROSS AGE FMR . . . 720
665 ALGORITHM CHOSUN-001 CROSS AGE FMR . . . 721
666 ALGORITHM CHTFACE-002 CROSS AGE FMR . . . 722
667 ALGORITHM CHTFACE-003 CROSS AGE FMR . . . 723
668 ALGORITHM CIB-000 CROSS AGE FMR . . . 724
669 ALGORITHM COGENT-003 CROSS AGE FMR . . . 725
670 ALGORITHM COGENT-004 CROSS AGE FMR . . . 726
671 ALGORITHM COGNITEC-000 CROSS AGE FMR . . . 727

672 ALGORITHM COGNITEC-001 CROSS AGE FMR . . . 728
673 ALGORITHM CTBCBANK-000 CROSS AGE FMR . . . 729
674 ALGORITHM CTBCBANK-001 CROSS AGE FMR . . . 730
675 ALGORITHM CUHKEE-001 CROSS AGE FMR . . . 731
676 ALGORITHM CYBEREXTRUDER-001 CROSS AGE FMR . . . 732
677 ALGORITHM CYBEREXTRUDER-002 CROSS AGE FMR . . . 733
678 ALGORITHM CYBERLINK-003 CROSS AGE FMR . . . 734
679 ALGORITHM CYBERLINK-004 CROSS AGE FMR . . . 735
680 ALGORITHM DAHUA-003 CROSS AGE FMR . . . 736
681 ALGORITHM DAHUA-004 CROSS AGE FMR . . . 737
682 ALGORITHM DEEPGLINT-001 CROSS AGE FMR . . . 738
683 ALGORITHM DEEPGLINT-002 CROSS AGE FMR . . . 739
684 ALGORITHM DEEPSEA-001 CROSS AGE FMR . . . 740
685 ALGORITHM DERMALOG-005 CROSS AGE FMR . . . 741
686 ALGORITHM DERMALOG-006 CROSS AGE FMR . . . 742
687 ALGORITHM DIDIGLOBALFACE-001 CROSS AGE FMR . . . 743
688 ALGORITHM DIGITALBARRIERS-002 CROSS AGE FMR . . . 744
689 ALGORITHM DSK-000 CROSS AGE FMR . . . 745
690 ALGORITHM EINETWORKS-000 CROSS AGE FMR . . . 746
691 ALGORITHM ERCACAT-001 CROSS AGE FMR . . . 747
692 ALGORITHM EXPASOFT-000 CROSS AGE FMR . . . 748
693 ALGORITHM F8-001 CROSS AGE FMR . . . 749
694 ALGORITHM FACESOFT-000 CROSS AGE FMR . . . 750
695 ALGORITHM FUJITSULAB-000 CROSS AGE FMR . . . 751
696 ALGORITHM GEO-000 CROSS AGE FMR . . . 752
697 ALGORITHM GLORY-001 CROSS AGE FMR . . . 753
698 ALGORITHM GLORY-002 CROSS AGE FMR . . . 754
699 ALGORITHM GORILLA-004 CROSS AGE FMR . . . 755
700 ALGORITHM HIK-001 CROSS AGE FMR . . . 756
701 ALGORITHM HR-001 CROSS AGE FMR . . . 757
702 ALGORITHM HR-002 CROSS AGE FMR . . . 758
703 ALGORITHM ICM-000 CROSS AGE FMR . . . 759
704 ALGORITHM ID3-003 CROSS AGE FMR . . . 760
705 ALGORITHM ID3-004 CROSS AGE FMR . . . 761
706 ALGORITHM IDEMIA-005 CROSS AGE FMR . . . 762
707 ALGORITHM IDEMIA-006 CROSS AGE FMR . . . 763
708 ALGORITHM IIT-001 CROSS AGE FMR . . . 764
709 ALGORITHM IIT-002 CROSS AGE FMR . . . 765
710 ALGORITHM IMAGUS-000 CROSS AGE FMR . . . 766
711 ALGORITHM IMAGUS-001 CROSS AGE FMR . . . 767
712 ALGORITHM IMPERIAL-000 CROSS AGE FMR . . . 768
713 ALGORITHM IMPERIAL-002 CROSS AGE FMR . . . 769
714 ALGORITHM INCODE-005 CROSS AGE FMR . . . 770
715 ALGORITHM INCODE-006 CROSS AGE FMR . . . 771
716 ALGORITHM INNOVATIVETECHNOLOGYLTD-001 CROSS AGE FMR . . . 772
717 ALGORITHM INNOVATIVETECHNOLOGYLTD-002 CROSS AGE FMR . . . 773
718 ALGORITHM INNOVATRICS-004 CROSS AGE FMR . . . 774
719 ALGORITHM INNOVATRICS-006 CROSS AGE FMR . . . 775
720 ALGORITHM INTELLICLOUDAI-001 CROSS AGE FMR . . . 776
721 ALGORITHM INTELLIFUSION-001 CROSS AGE FMR . . . 777
722 ALGORITHM INTELLIFUSION-002 CROSS AGE FMR . . . 778
723 ALGORITHM INTELLIVISION-001 CROSS AGE FMR . . . 779
724 ALGORITHM INTELLIVISION-002 CROSS AGE FMR . . . 780
725 ALGORITHM INTELRESEARCH-000 CROSS AGE FMR . . . 781
726 ALGORITHM INTELRESEARCH-001 CROSS AGE FMR . . . 782
727 ALGORITHM INTSYSMSU-001 CROSS AGE FMR . . . 783
728 ALGORITHM INTSYSMSU-002 CROSS AGE FMR . . . 784

729 ALGORITHM IQFACE-000 CROSS AGE FMR . . . 785
730 ALGORITHM IQFACE-001 CROSS AGE FMR . . . 786
731 ALGORITHM ISAP-001 CROSS AGE FMR . . . 787
732 ALGORITHM ISITYOU-000 CROSS AGE FMR . . . 788
733 ALGORITHM ISYSTEMS-001 CROSS AGE FMR . . . 789
734 ALGORITHM ISYSTEMS-002 CROSS AGE FMR . . . 790
735 ALGORITHM ITMO-006 CROSS AGE FMR . . . 791
736 ALGORITHM ITMO-007 CROSS AGE FMR . . . 792
737 ALGORITHM KAKAO-002 CROSS AGE FMR . . . 793
738 ALGORITHM KAKAO-003 CROSS AGE FMR . . . 794
739 ALGORITHM KEDACOM-000 CROSS AGE FMR . . . 795
740 ALGORITHM KNERON-003 CROSS AGE FMR . . . 796
741 ALGORITHM KNERON-005 CROSS AGE FMR . . . 797
742 ALGORITHM LOOKMAN-002 CROSS AGE FMR . . . 798
743 ALGORITHM LOOKMAN-004 CROSS AGE FMR . . . 799
744 ALGORITHM LUXAND-000 CROSS AGE FMR . . . 800
745 ALGORITHM MEGVII-001 CROSS AGE FMR . . . 801
746 ALGORITHM MEGVII-002 CROSS AGE FMR . . . 802
747 ALGORITHM MEIYA-001 CROSS AGE FMR . . . 803
748 ALGORITHM MICROFOCUS-001 CROSS AGE FMR . . . 804
749 ALGORITHM MICROFOCUS-002 CROSS AGE FMR . . . 805
750 ALGORITHM MT-000 CROSS AGE FMR . . . 806
751 ALGORITHM MT-002 CROSS AGE FMR . . . 807
752 ALGORITHM MVISION-001 CROSS AGE FMR . . . 808
753 ALGORITHM NAZHIAI-000 CROSS AGE FMR . . . 809
754 ALGORITHM NETBRIDGETECH-001 CROSS AGE FMR . . . 810
755 ALGORITHM NEUROTECHNOLOGY-008 CROSS AGE FMR . . . 811
756 ALGORITHM NEUROTECHNOLOGY-009 CROSS AGE FMR . . . 812
757 ALGORITHM NODEFLUX-002 CROSS AGE FMR . . . 813
758 ALGORITHM NOTIONTAG-000 CROSS AGE FMR . . . 814
759 ALGORITHM NTECHLAB-007 CROSS AGE FMR . . . 815
760 ALGORITHM NTECHLAB-008 CROSS AGE FMR . . . 816
761 ALGORITHM PARAVISION-004 CROSS AGE FMR . . . 817
762 ALGORITHM PIXELALL-003 CROSS AGE FMR . . . 818
763 ALGORITHM PIXELALL-004 CROSS AGE FMR . . . 819
764 ALGORITHM PSL-003 CROSS AGE FMR . . . 820
765 ALGORITHM PSL-005 CROSS AGE FMR . . . 821
766 ALGORITHM PXL-001 CROSS AGE FMR . . . 822
767 ALGORITHM PYRAMID-000 CROSS AGE FMR . . . 823
768 ALGORITHM RANKONE-008 CROSS AGE FMR . . . 824
769 ALGORITHM RANKONE-009 CROSS AGE FMR . . . 825
770 ALGORITHM REALNETWORKS-002 CROSS AGE FMR . . . 826
771 ALGORITHM REALNETWORKS-003 CROSS AGE FMR . . . 827
772 ALGORITHM REMARKAI-001 CROSS AGE FMR . . . 828
773 ALGORITHM REMARKAI-002 CROSS AGE FMR . . . 829
774 ALGORITHM ROKID-000 CROSS AGE FMR . . . 830
775 ALGORITHM ROKID-001 CROSS AGE FMR . . . 831
776 ALGORITHM S1-001 CROSS AGE FMR . . . 832
777 ALGORITHM SAFFE-001 CROSS AGE FMR . . . 833
778 ALGORITHM SAFFE-002 CROSS AGE FMR . . . 834
779 ALGORITHM SAMTECH-001 CROSS AGE FMR . . . 835
780 ALGORITHM SCANOVATE-001 CROSS AGE FMR . . . 836
781 ALGORITHM SCANOVATE-002 CROSS AGE FMR . . . 837
782 ALGORITHM SENSETIME-002 CROSS AGE FMR . . . 838
783 ALGORITHM SENSETIME-003 CROSS AGE FMR . . . 839
784 ALGORITHM SERTIS-000 CROSS AGE FMR . . . 840
785 ALGORITHM SHAMAN-000 CROSS AGE FMR . . . 841

786 ALGORITHM SHAMAN-001 CROSS AGE FMR . . . 842
787 ALGORITHM SHU-002 CROSS AGE FMR . . . 843
788 ALGORITHM SHU-003 CROSS AGE FMR . . . 844
789 ALGORITHM SIAT-002 CROSS AGE FMR . . . 845
790 ALGORITHM SIAT-004 CROSS AGE FMR . . . 846
791 ALGORITHM SJTU-001 CROSS AGE FMR . . . 847
792 ALGORITHM SJTU-002 CROSS AGE FMR . . . 848
793 ALGORITHM SMILART-002 CROSS AGE FMR . . . 849
794 ALGORITHM SMILART-003 CROSS AGE FMR . . . 850
795 ALGORITHM STAQU-000 CROSS AGE FMR . . . 851
796 ALGORITHM STARHYBRID-001 CROSS AGE FMR . . . 852
797 ALGORITHM SYNESIS-006 CROSS AGE FMR . . . 853
798 ALGORITHM SYNESIS-007 CROSS AGE FMR . . . 854
799 ALGORITHM SYNOLOGY-000 CROSS AGE FMR . . . 855
800 ALGORITHM SYNOLOGY-001 CROSS AGE FMR . . . 856
801 ALGORITHM TECH5-003 CROSS AGE FMR . . . 857
802 ALGORITHM TECH5-004 CROSS AGE FMR . . . 858
803 ALGORITHM TEVIAN-004 CROSS AGE FMR . . . 859
804 ALGORITHM TEVIAN-005 CROSS AGE FMR . . . 860
805 ALGORITHM TIGER-002 CROSS AGE FMR . . . 861
806 ALGORITHM TIGER-003 CROSS AGE FMR . . . 862
807 ALGORITHM TONGYI-005 CROSS AGE FMR . . . 863
808 ALGORITHM TOSHIBA-002 CROSS AGE FMR . . . 864
809 ALGORITHM TOSHIBA-003 CROSS AGE FMR . . . 865
810 ALGORITHM TRUEFACE-000 CROSS AGE FMR . . . 866
811 ALGORITHM TRUEFACE-001 CROSS AGE FMR . . . 867
812 ALGORITHM TUPUTECH-000 CROSS AGE FMR . . . 868
813 ALGORITHM ULSEE-001 CROSS AGE FMR . . . 869
814 ALGORITHM ULUFACE-002 CROSS AGE FMR . . . 870
815 ALGORITHM ULUFACE-003 CROSS AGE FMR . . . 871
816 ALGORITHM UPC-001 CROSS AGE FMR . . . 872
817 ALGORITHM VCOG-002 CROSS AGE FMR . . . 873
818 ALGORITHM VD-001 CROSS AGE FMR . . . 874
819 ALGORITHM VERIDAS-003 CROSS AGE FMR . . . 875
820 ALGORITHM VERIDAS-004 CROSS AGE FMR . . . 876
821 ALGORITHM VIA-000 CROSS AGE FMR . . . 877
822 ALGORITHM VIA-001 CROSS AGE FMR . . . 878
823 ALGORITHM VIDEMO-000 CROSS AGE FMR . . . 879
824 ALGORITHM VIDEONETICS-001 CROSS AGE FMR . . . 880
825 ALGORITHM VIDEONETICS-002 CROSS AGE FMR . . . 881
826 ALGORITHM VIGILANTSOLUTIONS-006 CROSS AGE FMR . . . 882
827 ALGORITHM VIGILANTSOLUTIONS-007 CROSS AGE FMR . . . 883
828 ALGORITHM VION-000 CROSS AGE FMR . . . 884
829 ALGORITHM VISIONBOX-000 CROSS AGE FMR . . . 885
830 ALGORITHM VISIONBOX-001 CROSS AGE FMR . . . 886
831 ALGORITHM VISIONLABS-007 CROSS AGE FMR . . . 887
832 ALGORITHM VISIONLABS-008 CROSS AGE FMR . . . 888
833 ALGORITHM VISTEAM-000 CROSS AGE FMR . . . 889
834 ALGORITHM VOCORD-007 CROSS AGE FMR . . . 890
835 ALGORITHM VOCORD-008 CROSS AGE FMR . . . 891
836 ALGORITHM WINSENSE-000 CROSS AGE FMR . . . 892
837 ALGORITHM WINSENSE-001 CROSS AGE FMR . . . 893
838 ALGORITHM X-LABORATORY-000 CROSS AGE FMR . . . 894
839 ALGORITHM X-LABORATORY-001 CROSS AGE FMR . . . 895
840 ALGORITHM XFORWARDAI-000 CROSS AGE FMR . . . 896
841 ALGORITHM YISHENG-004 CROSS AGE FMR . . . 897

842 ALGORITHM YITU-003 CROSS AGE FMR 898
843 ALGORITHM YOONIK-000 CROSS AGE FMR 899
844 ALGORITHM YUAN-000 CROSS AGE FMR 900

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Developer Name	Short Name	Seq. Num.	Validation Date
1	3Divi	3divi	003	2018-10-09
2	3Divi	3divi	004	2019-07-22
3	ADVANCE.AI	advance	002	2019-12-19
4	ASUSTek Computer Inc	asusaics	000	2019-10-24
5	ASUSTek Computer Inc	asusaics	001	2020-02-25
6	AYF Technology	ayftech	001	2020-07-06
7	Ability Enterprise - Andro Video	androvideo	000	2020-02-03
8	Acer Incorporated	acer	000	2020-01-08
9	Acer Incorporated	acer	001	2020-06-30
10	Adera Global PTE	adera	001	2019-06-17
11	Ai First	aifirst	001	2019-11-21
12	AiUnion Technology	aiunionface	000	2019-10-22
13	Alchera Inc	alchera	000	2019-03-01
14	Alchera Inc	alchera	000	2019-03-01
15	Alivia / Innovation Sys	isystems	001	2018-06-12
16	Alivia / Innovation Sys	isystems	002	2018-10-18
17	AllGoVision	allgovision	000	2019-03-01
18	AlphaSSTG	alphaface	001	2019-09-03
19	AlphaSSTG	alphaface	002	2020-02-20
20	Amplified Group	amplifiedgroup	001	2019-03-01
21	Anke Investments	anke	004	2019-06-27
22	Anke Investments	anke	005	2019-11-21
23	Antheus Technologia	antheus	000	2019-12-05
24	Antheus Technologia	antheus	001	2020-06-25
25	AnyVision	anyvision	002	2018-01-31
26	AnyVision	anyvision	004	2018-06-15
27	Aware	aware	004	2019-03-01
28	Aware	aware	005	2020-02-27
29	Awidit Systems	awiros	001	2019-09-23
30	Ayonix	ayonix	000	2017-06-22
31	Beihang University-ERCACAT	ercacat	001	2020-07-06
32	Beijing Alleyes Technology	alleyes	000	2020-03-09
33	Beijing Vion Technology Inc	vion	000	2018-10-19
34	BioID Technologies SA	bioidtechswiss	000	2019-11-15
35	Bitmain	bitmain	001	2018-10-17
36	CSA IntelliCloud Technology	intellicloudai	001	2019-08-13
37	CTBC Bank	ctbcbank	000	2019-06-28
38	CTBC Bank	ctbcbank	001	2019-10-28
39	Camvi Technologies	camvi	002	2018-10-19
40	Camvi Technologies	camvi	004	2019-07-12
41	Canon Information Technology (Beijing)	cib	000	2019-12-11
42	China Electronics Import-Export Corp	ceiec	002	2019-06-12
43	China Electronics Import-Export Corp	ceiec	003	2020-01-06
44	China University of Petroleum	upc	001	2019-06-05
45	Chinese Univeristy of Hong Kong	cuhkee	001	2020-03-18
46	Chosun University	chosun	000	2020-02-12
47	Chosun University	chosun	001	2020-07-01
48	Chunghwa Telecom	chtface	002	2019-12-07
49	Chunghwa Telecom	chtface	003	2020-06-24
50	Cognitec Systems GmbH	cognitec	000	2018-10-19
51	Cognitec Systems GmbH	cognitec	001	2019-03-01
52	Cyberextruder	cyberex	001	2017-08-02
53	Cyberextruder	cyberex	002	2018-01-30
54	Cyberlink Corp	cyberlink	003	2019-10-07
55	Cyberlink Corp	cyberlink	004	2020-02-27
56	DSK	dsk	000	2019-06-28
57	Dahua Technology	dahua	003	2019-08-14
58	Dahua Technology	dahua	004	2019-12-18
59	Deepglint	deepglint	001	2019-06-21
60	Deepglint	deepglint	002	2019-11-15
61	Dermalog	dermalog	005	2018-02-02
62	Dermalog	dermalog	006	2018-10-18
63	DiDi ChuXing Technology	didiglobalface	001	2019-10-23
64	Digital Barriers	barriers	002	2019-03-01
65	Expasoft LLC	expasoft	000	2020-01-06
66	FaceSoft	facesoft	000	2019-07-10
67	FarBar Inc	f8	001	2019-07-11
68	Fujitsu Research and Development Center	fujitsulab	000	2020-02-04
69	Gemalto Cogent	cogent	003	2019-03-01
70	Gemalto Cogent	cogent	004	2019-06-14

Table 1: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Developer Name	Short Name	Seq. Num.	Validation Date
71	GeoVision Inc	geo	000	2020-06-29
72	Glory	glory	001	2018-06-08
73	Glory	glory	002	2019-11-12
74	Gorilla Technology	gorilla	004	2019-11-04
75	Gorilla Technology	gorilla	005	2020-03-11
76	Guangzhou Pixel Solutions	pixelall	003	2019-10-15
77	Guangzhou Pixel Solutions	pixelall	004	2020-07-02
78	Hengrui AI Technology	hr	001	2019-06-04
79	Hengrui AI Technology	hr	001	2019-10-08
80	Hikvision Research Institute	hik	001	2019-03-01
81	ICM Airport Technics	icm	000	2020-07-10
82	ID3 Technology	id3	003	2018-10-05
83	ID3 Technology	id3	004	2019-03-01
84	ITMO University	itmo	006	2019-03-01
85	ITMO University	itmo	007	2020-01-06
86	Idemia	idemia	005	2019-10-11
87	Idemia	idemia	006	2020-07-06
88	Imagus Technology Pty	imagus	000	2019-06-19
89	Imagus Technology Pty	imagus	001	2019-10-22
90	Imperial College London	imperial	000	2019-03-01
91	Imperial College London	imperial	002	2019-08-28
92	Incode Technologies Inc	incode	005	2019-10-17
93	Incode Technologies Inc	incode	006	2020-02-20
94	Innovative Technology	innovativetechnologyltd	001	2019-10-22
95	Innovative Technology	innovativetechnologyltd	002	2020-02-26
96	Innovatrics	innovatrics	004	2018-10-19
97	Innovatrics	innovatrics	006	2019-08-13
98	Institute of Information Technologies	iit	001	2019-07-05
99	Institute of Information Technologies	iit	002	2019-12-04
100	Intel Research Group	intelresearch	000	2019-07-08
101	Intel Research Group	intelresearch	001	2020-01-14
102	Intellivision	intellivision	001	2017-10-10
103	Intellivision	intellivision	002	2019-08-23
104	Is It You	isityou	000	2017-06-26
105	Kakao Enterprise	kakao	002	2019-06-19
106	Kakao Enterprise	kakao	003	2020-02-26
107	Kedacom International Pte	kedacom	000	2019-06-03
108	Kneron Inc	kneron	003	2019-07-01
109	Kneron Inc	kneron	005	2020-02-21
110	Lomonosov Moscow State University	intsysmsu	001	2019-10-22
111	Lomonosov Moscow State University	intsysmsu	002	2020-03-12
112	Lookman Electroplast Industries	lookman	002	2018-06-13
113	Lookman Electroplast Industries	lookman	004	2019-06-03
114	Luxand Inc	luxand	000	2019-11-07
115	MVision	mvision	001	2019-11-12
116	Megvii/Face++	megvii	001	2018-06-15
117	Megvii/Face++	megvii	002	2018-10-19
118	MicroFocus	microfocus	001	2018-06-13
119	MicroFocus	microfocus	002	2018-10-17
120	Momentum Digital	sertis	000	2019-10-07
121	Moontime Smart Technology	mt	000	2019-06-03
122	Moontime Smart Technology	mt	002	2020-07-02
123	N-Tech Lab	ntech	007	2019-06-25
124	N-Tech Lab	ntech	008	2020-01-06
125	Netbridge Technology Incoporation	netbridgetech	001	2020-01-08
126	Neurotechnology	neurotechnology	008	2020-01-08
127	Neurotechnology	neurotechnology	009	2020-07-07
128	Nodeflux	nodeflux	002	2019-08-13
129	NotionTag Technologies Private Limited	notiontag	000	2019-06-12
130	PXL Vision AG	pxl	001	2020-06-30
131	Panasonic R+D Center Singapore	psl	003	2019-10-01
132	Panasonic R+D Center Singapore	psl	005	2020-07-06
133	Paravision (EverAI)	everai paravision	003	2019-07-01
134	Paravision (EverAI)	paravision	004	2019-12-11
135	Pyramid Cyber Security + Forensic (P)	pyramid	000	2019-11-04
136	Rank One Computing	rankone	008	2019-11-12
137	Rank One Computing	rankone	009	2020-06-26
138	Realnetworks Inc	realnetworks	002	2019-02-28
139	Realnetworks Inc	realnetworks	003	2019-06-12
140	Remark Holdings	remarkai	001	2019-03-01

Table 2: Summary of participant information included in this report.

	Developer Name	Short Name	Seq. Num.	Validation Date
141	Remark Holdings	remarkai	001	2019-11-21
142	Rokid Corporation	rokid	000	2019-08-01
143	Rokid Corporation	rokid	001	2019-12-13
144	Saffe	saffe	001	2018-10-19
145	Saffe	saffe	002	2019-03-01
146	Samsung S1 Corp	s1	001	2019-12-06
147	Samtech InfoNet Limited	samtech	001	2019-10-15
148	Scanovate	scanovate	001	2019-11-12
149	Scanovate	scanovate	002	2020-06-26
150	Sensetime Group	sensetime	002	2018-10-19
151	Sensetime Group	sensetime	003	2019-06-04
152	Shaman Software	shaman	000	2017-12-05
153	Shaman Software	shaman	001	2018-01-13
154	Shanghai Jiao Tong University	sjtu	001	2019-09-27
155	Shanghai Jiao Tong University	sjtu	002	2020-02-12
156	Shanghai Ulucu Electronics Technology	uluface	002	2019-07-10
157	Shanghai Ulucu Electronics Technology	uluface	003	2019-11-12
158	Shanghai Universiy - Shanghai Film Academy	shu	002	2019-12-10
159	Shanghai Universiy - Shanghai Film Academy	shu	003	2020-06-24
160	Shanghai Yitu Technology	yitu	003	2019-03-01
161	Shenzhen AiMall Tech	aimall	001	2019-11-12
162	Shenzhen AiMall Tech	aimall	002	2020-03-12
163	Shenzhen EI Networks	einetworks	000	2019-08-13
164	Shenzhen Inst Adv Integrated Tech CAS	siat	002	2018-06-13
165	Shenzhen Inst Adv Integrated Tech CAS	siat	004	2019-03-01
166	Shenzhen Intellifusion Technologies	intellifusion	001	2019-08-22
167	Shenzhen Intellifusion Technologies	intellifusion	002	2020-03-18
168	Smilart	smilart	002	2018-02-06
169	Smilart	smilart	003	2018-06-18
170	Staqu Technologies	staqu	000	2020-07-15
171	Star Hybrid Limited	starhybrid	001	2019-06-19
172	Su Zhou NaZhiTianDi intelligent technology	nazhiai	000	2020-06-25
173	Synesis	synesis	006	2019-10-10
174	Synesis	synesis	007	2020-06-24
175	Synology Inc	synology	000	2019-10-23
176	Synology Inc	synology	001	2020-02-26
177	TUPU Technology	tuputech	000	2019-10-11
178	Taiwan AI Labs	ailabs	001	2019-12-18
179	Tech5 SA	tech5	003	2019-08-19
180	Tech5 SA	tech5	004	2020-03-09
181	Tencent Deepsea Lab	deepsea	001	2019-06-03
182	Tevian	tevian	004	2019-03-01
183	Tevian	tevian	005	2019-09-21
184	TigerIT Americas LLC	tiger	002	2018-06-13
185	TigerIT Americas LLC	tiger	003	2018-10-16
186	TongYi Transportation Technology	tongyi	005	2019-06-12
187	Toshiba	toshiba	002	2018-10-19
188	Toshiba	toshiba	003	2019-03-01
189	Trueface.ai	trueface	000	2019-10-08
190	Trueface.ai	trueface	001	2020-07-20
191	ULSee Inc	ulsee	001	2019-07-31
192	Universidade de Coimbra	visteam	000	2020-01-14
193	VCognition	vcog	002	2017-06-12
194	Veridas Digital Authentication Solutions S.L.	veridas	003	2019-11-27
195	Veridas Digital Authentication Solutions S.L.	veridas	004	2020-07-21
196	Via Technologies Inc	via	000	2019-07-08
197	Via Technologies Inc	via	001	2020-01-08
198	Videmo Intelligente Videoanalyse	videmo	000	2019-12-19
199	Videonetics Technology Pvt	videonetics	001	2019-06-19
200	Videonetics Technology Pvt	videonetics	002	2019-11-21
201	Vigilant Solutions	vigilant	006	2019-03-01
202	Vigilant Solutions	vigilantsolutions	007	2019-06-27
203	Visidon	visidon	001	2019-02-26
204	Vision-Box	visionbox	000	2019-02-26
205	Vision-Box	visionbox	001	2019-03-01
206	VisionLabs	visionlabs	007	2019-06-12
207	VisionLabs	visionlabs	008	2020-01-06
208	Vocord	vocord	007	2019-06-06
209	Vocord	vocord	008	2020-01-031
210	Winsense	winsense	000	2019-06-17

Table 3: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Developer Name	Short Name	Seq. Num.	Validation Date
211	Winsense	winsense	001	2019-10-16
212	X-Laboratory	x-laboratory	000	2019-09-03
213	X-Laboratory	x-laboratory	001	2020-01-21
214	Xforward AI Technology	xforwardai	000	2020-02-06
215	Xiamen Meiya Pico Information	meiya	001	2019-03-01
216	YooniK	yoonik	000	2020-06-24
217	Yuan High-Tech Development	yuan	000	2020-06-30
218	Zhuhai Yisheng Electronics Technology	yisheng	004	2018-06-12
219	iQIYI Inc	iqface	000	2019-06-04
220	iQIYI Inc	iqface	001	2019-12-11
221	iSAP Solution Corporation	isap	001	2019-08-07

Table 4: Summary of participant information included in this report.

	ALGORITHM	CONFIG	TEMPLATE						COMPARISON[4]	
	NAME	DATA	MEMORY	SIZE	GENERATION TIME (ms)[3]				TIME (ns)[4]	
		(KB)[1]	(MB)[2]	(B)	MUGSHOT	ISO	PHOTOJOURN.	WILD	GENUINE	IMPOSTOR
1	3divi-003	191636	^{41}358	^{210}4096 ± 0	^{132}650 ± 90	^{63}409 ± 33	^{49}355 ± 73	^{62}399 ± 33	^{22}627 ± 11	^{26}623 ± 32
2	3divi-004	263670	^{51}430	^{108}2048 ± 0	^{216}984 ± 131	^{149}746 ± 43	^{127}682 ± 71	^{148}729 ± 35	^{42}794 ± 35	^{43}801 ± 40
3	acer-000	109735	^{64}478	^{105}2048 ± 0	^{25}222 ± 0	^{27}223 ± 1	^{28}229 ± 2	^{29}241 ± 24	^{64}1065 ± 40	^{73}1109 ± 35
4	acer-001	36650	^{47}417	^{27}512 ± 0	^{23}199 ± 0	^{25}198 ± 0	^{26}198 ± 0	^{25}198 ± 0	^{128}2453 ± 44	^{130}2461 ± 62
5	adera-001	0	^{27}190	^{193}2560 ± 0	^{9}97 ± 0	-	-	-	^{100}1604 ± 71	^{100}1649 ± 56
6	advance-002	257173	^{35}295	^{69}2048 ± 0	^{176}811 ± 2	-	-	-	^{56}987 ± 10	^{55}988 ± 45
7	aifirst-001	224157	^{65}485	^{68}2048 ± 0	^{109}587 ± 2	^{105}573 ± 2	^{96}571 ± 20	^{110}590 ± 1	^{70}1099 ± 14	^{72}1087 ± 45
8	ailabs-001	1054663	^{162}1252	^{82}2048 ± 0	^{138}664 ± 4	^{89}526 ± 1	^{71}491 ± 60	^{85}513 ± 2	^{213}104034 ± 661	^{213}103415 ± 7722
9	aimall-001	128820	^{23}178	^{41}1024 ± 0	^{49}326 ± 1	-	-	-	^{159}4127 ± 72	^{157}3909 ± 166
10	aimall-002	370156	^{183}1576	^{113}2048 ± 0	^{168}776 ± 4	^{156}775 ± 3	^{145}775 ± 4	^{158}774 ± 3	^{211}72811 ± 7399	^{211}71216 ± 6286
11	aiunionface-000	241642	^{46}402	^{110}2048 ± 0	^{128}637 ± 13	^{110}592 ± 7	^{100}585 ± 15	^{113}598 ± 8	^{65}1072 ± 19	^{71}1080 ± 47
12	alchera-000	258450	^{94}614	^{91}2048 ± 0	^{110}587 ± 13	^{77}489 ± 8	^{68}473 ± 21	^{75}483 ± 7	^{144}3189 ± 32	^{143}3031 ± 142
13	alchera-000	174013	^{63}473	^{83}2048 ± 0	^{123}627 ± 11	^{91}527 ± 6	^{79}513 ± 21	^{90}525 ± 7	^{145}3342 ± 81	^{146}3243 ± 47
14	alleyes-000	507636	^{128}857	^{117}2048 ± 0	^{171}784 ± 1	^{169}826 ± 2	^{159}823 ± 40	^{179}895 ± 2	^{90}1298 ± 34	^{91}1303 ± 51
15	allgovision-000	172509	^{84}561	^{132}2048 ± 0	^{57}384 ± 8	^{53}374 ± 11	^{56}392 ± 26	^{58}383 ± 16	^{205}29903 ± 406	^{206}29735 ± 194
16	alphaface-001	259849	^{79}527	^{98}2048 ± 0	^{118}612 ± 1	^{118}612 ± 1	^{106}613 ± 1	^{117}615 ± 1	^{58}1008 ± 10	^{58}1002 ± 19
17	alphaface-002	768995	^{176}1434	^{118}2048 ± 0	^{124}628 ± 2	^{122}627 ± 1	^{42}326 ± 1	^{45}327 ± 1	^{48}945 ± 25	^{50}935 ± 17
18	amplifiedgroup-001	0	^{9}81	^{36}866 ± 2	^{6}93 ± 0	-	-	-	^{210}57803 ± 4210	^{210}56365 ± 1196
19	androvideo-000	128502	^{43}360	^{87}2048 ± 0	^{45}308 ± 1	^{42}295 ± 0	^{38}282 ± 24	^{40}284 ± 2	^{152}3580 ± 32	^{152}3609 ± 60
20	anke-004	349388	^{101}706	^{169}2056 ± 0	^{122}625 ± 1	^{114}599 ± 9	-	^{107}581 ± 2	^{23}633 ± 22	^{28}632 ± 34
21	anke-005	328553	^{157}1134	^{171}2056 ± 0	^{111}590 ± 2	^{103}561 ± 2	^{86}535 ± 32	^{96}545 ± 1	^{29}685 ± 19	^{32}687 ± 26
22	antheus-000	119453	^{16}116	^{28}520 ± 0	^{11}109 ± 1	^{17}159 ± 1	^{25}173 ± 14	^{15}140 ± 1	^{176}6901 ± 268	^{174}6936 ± 103
23	antheus-001	119453	^{17}118	^{29}520 ± 0	^{13}120 ± 1	^{26}204 ± 1	^{27}221 ± 20	^{22}178 ± 1	^{172}6218 ± 47	^{169}6216 ± 45
24	anyvision-002	662659	^{60}468	^{43}1024 ± 0	^{27}248 ± 0	^{24}194 ± 0	-	^{24}190 ± 1	^{212}74069 ± 188	^{212}74019 ± 198
25	anyvision-004	401001	^{155}1102	^{40}1024 ± 0	^{52}355 ± 1	^{48}344 ± 1	^{62}425 ± 112	^{49}342 ± 1	^{113}1891 ± 51	^{109}1829 ± 85
26	asusaics-000	257418	^{92}605	^{95}2048 ± 0	^{79}484 ± 13	^{62}407 ± 10	^{57}396 ± 18	^{63}404 ± 7	^{166}5455 ± 78	^{167}5422 ± 112
27	asusaics-001	257418	^{87}595	^{213}4096 ± 0	^{189}842 ± 17	^{152}759 ± 7	^{141}747 ± 28	^{155}759 ± 10	^{183}8618 ± 42	^{183}8638 ± 136
28	aware-004	427829	^{191}1820	^{184}2084 ± 0	^{200}900 ± 10	^{174}872 ± 11	^{166}872 ± 30	^{176}881 ± 33	^{88}1279 ± 50	^{90}1287 ± 100
29	aware-005	300017	^{164}1265	^{60}1572 ± 0	^{197}886 ± 23	^{172}861 ± 14	^{163}858 ± 151	^{177}889 ± 45	^{96}1475 ± 63	^{94}1427 ± 115
30	awiros-001	15499	^{12}88	^{18}512 ± 0	^{8}97 ± 6	^{6}87 ± 6	-	^{6}86 ± 7	^{67}1079 ± 44	^{65}1050 ± 45
31	ayftech-001	195423	^{106}731	^{25}512 ± 0	^{67}408 ± 23	^{46}339 ± 10	^{41}319 ± 18	^{46}336 ± 11	^{19}615 ± 16	^{48}885 ± 44
32	ayonix-000	58505	^{6}69	^{45}1036 ± 0	^{2}18 ± 2	^{1}10 ± 1	^{4}2 ± 4	^{1}10 ± 1	^{21}621 ± 23	^{25}620 ± 26
33	bioidtechswiss-000	758466	^{143}1039	^{10}256 ± 0	^{126}630 ± 2	^{115}608 ± 1	^{112}629 ± 2	^{122}630 ± 1	^{206}34416 ± 137	^{207}34403 ± 126
34	bitmain-001	287734	^{19}148	^{1}64 ± 0	^{73}444 ± 88	^{40}292 ± 25	^{24}173 ± 37	^{38}276 ± 71	^{112}1887 ± 31	^{111}1877 ± 26
35	camvi-002	236278	^{107}737	^{42}1024 ± 0	^{145}677 ± 7	^{123}628 ± 4	^{110}624 ± 7	^{121}627 ± 3	^{18}612 ± 26	^{20}603 ± 20
36	camvi-004	280733	^{135}919	^{123}2048 ± 0	^{165}759 ± 10	^{147}733 ± 3	^{139}730 ± 10	^{149}731 ± 4	^{49}948 ± 40	^{52}963 ± 31
37	ceiec-002	269063	^{48}426	^{84}2048 ± 0	^{119}612 ± 17	^{100}557 ± 6	^{91}554 ± 21	^{101}555 ± 7	^{120}2188 ± 57	^{125}2301 ± 56
38	ceiec-003	260371	^{50}430	^{85}2048 ± 0	^{179}817 ± 4	-	-	-	^{123}2256 ± 38	^{123}2241 ± 54
39	chosun-000	167093	^{18}136	^{78}2048 ± 0	^{72}441 ± 1	^{59}402 ± 1	^{6}9 ± 13	^{61}399 ± 1	^{54}983 ± 20	^{54}983 ± 29
40	chosun-001	765615	^{66}491	^{136}2048 ± 0	^{170}783 ± 2	^{113}599 ± 1	^{93}562 ± 31	^{108}589 ± 1	^{57}998 ± 25	^{63}1035 ± 11
41	chtface-002	363153	^{154}1100	^{104}2048 ± 0	^{107}584 ± 14	^{94}530 ± 9	^{81}521 ± 18	^{92}528 ± 7	^{124}2264 ± 26	^{122}2234 ± 103
42	chtface-003	363153	^{158}1178	^{139}2048 ± 0	^{113}594 ± 16	^{92}528 ± 7	^{83}523 ± 19	^{91}527 ± 7	^{116}2110 ± 37	^{121}2219 ± 65
43	cib-000	340288	^{83}557	^{116}2048 ± 0	^{218}993 ± 40	^{171}859 ± 21	^{162}845 ± 41	^{173}858 ± 22	^{201}24340 ± 60	^{202}25972 ± 97
44	cogent-003	698290	^{177}1445	^{37}973 ± 0	^{210}952 ± 0	-	-	-	^{187}12496 ± 75	^{186}11822 ± 163

Notes	
1	The configuration size does not capture static data included in libraries. We do not count these because some algorithms include common ancilliary libraries for image processing (e.g. OpenCV) or numerical computation (e.g. BLAS).
2	The memory usage is the peak resident set size reported by the ps system call during template generation.
3	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
4	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 5: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	TEMPLATE						COMPARISON[4]	
	NAME	DATA	MEMORY	SIZE	GENERATION TIME (ms)[3]				TIME (ns)[4]	
		(KB)[1]	(MB)[2]	(B)	MUGSHOT	ISO	PHOTOJOURN.	WILD	GENUINE	IMPOSTOR
45	cogent-004	722919	^{146}1059	^{65}1983 ± 0	^{217}987 ± 50	-	-	-	^{192}15536 ± 75	^{192}15964 ± 708
46	cognitec-000	474759	^{68}495	^{156}2052 ± 0	^{26}224 ± 1	-	-	-	^{156}3835 ± 108	^{154}3782 ± 83
47	cognitec-001	476809	^{70}498	^{162}2052 ± 0	^{39}293 ± 17	-	-	-	^{160}4253 ± 59	^{159}4102 ± 167
48	ctbcbank-000	257208	^{85}570	^{93}2048 ± 0	^{101}568 ± 43	^{81}498 ± 19	-	^{81}498 ± 15	^{150}3551 ± 87	^{161}4805 ± 209
49	ctbcbank-001	275511	^{89}603	^{138}2048 ± 0	^{134}652 ± 35	^{112}595 ± 20	-	^{112}595 ± 17	^{157}3926 ± 45	^{158}3924 ± 56
50	cuhkee-001	787853	^{203}2515	^{157}2052 ± 0	^{214}977 ± 31	-	-	-	^{137}2719 ± 60	^{138}2783 ± 56
51	cyberex-001	121211	^{24}178	^{9}256 ± 0	^{199}893 ± 25	^{160}791 ± 17	-	^{156}765 ± 24	^{68}1083 ± 16	^{70}1079 ± 19
52	cyberex-002	168909	^{29}194	^{70}2048 ± 0	^{88}532 ± 6	^{83}505 ± 7	^{82}522 ± 25	^{87}515 ± 10	^{109}1803 ± 14	^{107}1779 ± 22
53	cyberlink-003	470949	^{119}824	^{155}2052 ± 0	^{69}423 ± 1	^{70}441 ± 1	^{65}440 ± 20	^{71}441 ± 1	^{126}2366 ± 38	^{127}2373 ± 45
54	cyberlink-004	340894	^{144}1046	^{217}4140 ± 0	^{156}712 ± 1	^{141}713 ± 1	^{134}716 ± 1	^{141}716 ± 1	^{155}3693 ± 51	^{156}3898 ± 71
55	dahua-003	605337	^{211}3739	^{125}2048 ± 0	^{89}535 ± 2	-	-	-	^{25}648 ± 20	^{27}631 ± 34
56	dahua-004	832455	^{214}4885	^{99}2048 ± 0	^{159}735 ± 3	^{148}738 ± 8	^{140}734 ± 4	^{150}734 ± 2	^{37}730 ± 25	^{34}707 ± 44
57	deepglint-001	569802	^{134}917	^{207}4096 ± 0	^{157}721 ± 4	^{143}718 ± 1	^{133}715 ± 1	^{143}717 ± 1	^{154}3680 ± 35	^{151}3517 ± 182
58	deepglint-002	459642	^{186}1614	^{204}4096 ± 0	^{144}677 ± 2	^{134}675 ± 2	^{129}683 ± 2	^{125}661 ± 2	^{190}13633 ± 87	^{188}12905 ± 440
59	deepsea-001	147497	^{42}358	^{38}1024 ± 0	^{125}630 ± 7	^{120}619 ± 3	^{109}623 ± 8	^{120}625 ± 2	^{93}1401 ± 37	^{95}1467 ± 50
60	dermalog-005	0	^{40}357	^{2}128 ± 0	^{15}130 ± 11	^{11}121 ± 13	^{12}107 ± 21	^{9}122 ± 11	^{9}499 ± 22	^{10}500 ± 22
61	dermalog-006	0	^{141}970	^{3}128 ± 0	^{87}532 ± 12	^{90}526 ± 20	^{78}513 ± 27	^{93}529 ± 20	^{10}506 ± 23	^{7}459 ± 23
62	didiglobalface-001	259849	^{78}527	^{97}2048 ± 0	^{117}612 ± 1	^{116}612 ± 1	^{105}612 ± 1	^{115}612 ± 1	^{53}973 ± 20	^{56}988 ± 20
63	barriers-002	83002	^{195}1930	^{173}2056 ± 0	^{24}209 ± 11	^{21}180 ± 12	^{22}170 ± 15	^{23}184 ± 15	^{188}13409 ± 228	^{189}13267 ± 206
64	dsk-000	11967	^{30}252	^{20}512 ± 0	^{43}304 ± 47	^{12}131 ± 18	^{13}110 ± 40	^{16}143 ± 29	^{178}7152 ± 115	^{175}7134 ± 111
65	einetworks-000	372608	^{130}880	^{178}2056 ± 0	^{130}645 ± 3	-	-	-	^{162}4876 ± 66	^{162}5156 ± 77
66	ercacat-001	811623	^{208}2816	^{166}2052 ± 0	^{219}1052 ± 3	^{191}972 ± 2	^{180}989 ± 31	^{186}936 ± 2	^{132}2551 ± 62	^{131}2501 ± 81
67	everai paravision-003	539802	^{161}1225	^{206}4096 ± 0	^{142}674 ± 4	^{133}673 ± 1	^{123}673 ± 2	^{133}672 ± 1	^{32}699 ± 20	^{37}713 ± 47
68	expasoft-000	15341	^{13}100	^{143}2048 ± 0	^{4}68 ± 0	^{4}72 ± 6	^{8}68 ± 0	^{4}68 ± 0	^{107}1779 ± 26	^{106}1757 ± 97
69	f8-001	272977	^{165}1276	^{81}2048 ± 0	^{184}822 ± 39	-	-	-	^{191}15262 ± 139	^{191}15277 ± 212
70	facesoft-000	370120	^{115}796	^{149}2048 ± 0	^{143}675 ± 18	^{129}666 ± 2	^{118}666 ± 3	^{127}664 ± 2	^{122}2239 ± 28	^{124}2277 ± 96
71	fujitsulab-000	0	^{56}453	^{21}512 ± 0	^{68}419 ± 1	^{61}405 ± 1	^{58}399 ± 12	^{70}441 ± 1	^{153}3613 ± 37	^{153}3621 ± 29
72	geo-000	114483	^{33}279	^{92}2048 ± 0	^{190}851 ± 1	^{179}880 ± 3	^{124}675 ± 290	^{185}935 ± 1	^{214}137544 ± 6225	^{214}137925 ± 6548
73	glory-001	0	^{168}1331	^{62}1726 ± 0	^{62}393 ± 2	^{52}372 ± 5	^{51}367 ± 22	^{57}381 ± 3	^{185}9607 ± 128	^{185}9539 ± 182
74	glory-002	0	^{142}982	^{187}2106 ± 0	^{114}594 ± 3	^{99}553 ± 2	^{98}572 ± 7	^{105}575 ± 3	^{175}6787 ± 85	^{171}6551 ± 249
75	gorilla-004	186952	^{126}853	^{191}2192 ± 0	^{59}389 ± 3	^{58}390 ± 1	^{55}388 ± 4	^{66}427 ± 2	^{138}2768 ± 44	^{136}2745 ± 44
76	gorilla-005	100684	^{96}629	^{190}2192 ± 0	^{64}407 ± 3	^{60}402 ± 2	^{59}407 ± 5	^{64}415 ± 4	^{135}2678 ± 42	^{137}2770 ± 112
77	hik-001	667866	^{216}6597	^{53}1408 ± 0	^{133}651 ± 0	^{124}629 ± 1	^{113}629 ± 3	^{119}624 ± 1	^{8}488 ± 19	^{8}477 ± 22
78	hr-001	346156	^{187}1682	^{180}2057 ± 0	^{139}665 ± 3	-	-	-	^{193}17816 ± 260	^{193}17878 ± 464
79	hr-001	390059	^{169}1337	^{181}2057 ± 0	^{203}908 ± 3	-	-	-	^{199}22530 ± 416	^{199}21651 ± 533
80	icm-000	747764	^{2}18	^{88}2048 ± 0	^{44}308 ± 36	^{16}143 ± 6	^{17}133 ± 30	^{14}138 ± 5	^{202}25341 ± 130	^{201}25352 ± 114
81	id3-003	265951	^{38}354	^{13}264 ± 0	^{46}316 ± 19	^{36}274 ± 7	^{37}272 ± 19	^{37}273 ± 8	^{91}1330 ± 25	^{92}1354 ± 28
82	id3-004	171526	^{93}613	^{12}264 ± 0	^{93}541 ± 11	^{84}510 ± 8	^{77}510 ± 21	^{84}513 ± 11	^{75}1135 ± 23	^{82}1156 ± 32
83	idemia-005	509824	^{95}618	^{34}588 ± 0	^{84}514 ± 15	^{82}505 ± 3	^{73}494 ± 31	^{82}501 ± 4	^{174}6657 ± 54	^{172}6616 ± 53
84	idemia-006	570566	^{137}932	^{35}668 ± 0	^{147}679 ± 4	^{135}676 ± 2	^{121}671 ± 27	^{131}670 ± 2	^{163}5223 ± 80	^{163}5193 ± 72
85	iit-001	269176	^{112}788	^{112}2048 ± 0	^{152}699 ± 4	^{139}697 ± 1	^{131}697 ± 1	^{138}697 ± 1	^{63}1060 ± 48	^{68}1074 ± 54
86	iit-002	259579	^{105}731	^{135}2048 ± 0	^{85}514 ± 1	^{88}523 ± 1	^{80}521 ± 2	^{89}523 ± 1	^{59}1023 ± 7	^{59}1011 ± 66
87	imagus-000	183453	^{59}466	^{141}2048 ± 0	^{70}425 ± 24	^{64}418 ± 22	^{61}421 ± 19	^{72}454 ± 15	^{77}1145 ± 25	^{104}1718 ± 63
88	imagus-001	282680	^{120}826	^{109}2048 ± 0	^{174}807 ± 29	^{164}799 ± 20	^{161}836 ± 49	^{166}805 ± 12	^{60}1045 ± 22	^{49}934 ± 45

Notes	
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3	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
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Table 6: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	TEMPLATE						COMPARISON[4]	
	NAME	DATA	MEMORY	SIZE	GENERATION TIME (ms)[3]				TIME (ns)[4]	
		(KB)[1]	(MB)[2]	(B)	MUGSHOT	ISO	PHOTOJOURN.	WILD	GENUINE	IMPOSTOR
89	imperial-000	370120	^{116}796	^{107}2048 ± 0	^{140}669 ± 1	^{130}668 ± 2	^{119}668 ± 2	^{128}667 ± 1	^{118}2130 ± 32	^{116}2052 ± 100
90	imperial-002	472327	^{192}1826	^{72}2048 ± 0	^{102}569 ± 1	^{104}569 ± 1	^{95}569 ± 1	^{103}569 ± 1	^{125}2278 ± 90	^{117}2131 ± 44
91	incode-005	256242	^{152}1089	^{103}2048 ± 0	^{100}566 ± 1	^{71}448 ± 1	^{94}568 ± 20	^{95}531 ± 2	^{104}1695 ± 38	^{101}1663 ± 85
92	incode-006	266095	^{118}814	^{75}2048 ± 0	^{78}472 ± 1	^{74}478 ± 0	^{69}479 ± 13	^{80}497 ± 1	^{108}1788 ± 41	^{108}1798 ± 59
93	innovativetechnologyltd-001	177232	^{36}341	^{114}2048 ± 0	^{71}433 ± 7	^{69}439 ± 5	^{66}445 ± 10	^{68}432 ± 6	^{111}1877 ± 42	^{112}1924 ± 97
94	innovativetechnologyltd-002	173939	^{132}912	^{124}2048 ± 0	^{137}661 ± 2	^{106}573 ± 1	^{92}554 ± 21	^{102}566 ± 2	^{110}1841 ± 50	^{110}1857 ± 59
95	innovatrics-004	0	^{172}1367	^{48}1076 ± 0	^{61}391 ± 0	^{72}449 ± 1	^{52}383 ± 89	^{36}271 ± 1	^{182}8573 ± 274	^{181}7929 ± 244
96	innovatrics-006	0	^{156}1107	^{30}538 ± 0	^{181}820 ± 5	^{173}868 ± 4	^{156}815 ± 80	^{146}726 ± 5	^{170}5855 ± 204	^{165}5266 ± 118
97	intellicloudai-001	220831	^{98}655	^{146}2048 ± 0	^{77}468 ± 2	^{75}481 ± 2	^{70}482 ± 16	^{74}473 ± 2	^{62}1056 ± 4	^{66}1051 ± 72
98	intellifusion-001	271872	^{108}762	^{77}2048 ± 0	^{166}764 ± 38	^{138}684 ± 32	^{115}646 ± 41	^{132}671 ± 22	^{71}1112 ± 28	^{75}1128 ± 41
99	intellifusion-002	762731	^{139}941	^{208}4096 ± 0	^{208}950 ± 2	^{188}942 ± 2	^{169}884 ± 3	^{178}892 ± 2	^{105}1713 ± 57	^{102}1665 ± 87
100	intellivision-001	43692	^{8}74	^{176}2056 ± 0	^{3}62 ± 2	^{3}49 ± 1	-	^{3}47 ± 0	^{133}2573 ± 91	^{135}2544 ± 38
101	intellivision-002	43692	^{10}81	^{170}2056 ± 0	^{48}322 ± 1	^{38}280 ± 1	^{15}123 ± 88	^{31}244 ± 0	^{189}13525 ± 134	^{187}12782 ± 278
102	intelresearch-000	388229	^{200}2406	^{73}2048 ± 0	^{201}902 ± 6	^{180}902 ± 2	^{171}902 ± 4	^{180}902 ± 3	^{161}4800 ± 152	^{160}4561 ± 97
103	intelresearch-001	353997	^{175}1433	^{121}2048 ± 0	^{148}682 ± 4	^{131}671 ± 1	^{120}669 ± 10	^{134}676 ± 12	^{151}3553 ± 57	^{149}3462 ± 161
104	intsysmsu-001	384409	^{114}789	^{101}2048 ± 0	^{120}614 ± 2	^{117}612 ± 2	^{107}613 ± 2	^{116}613 ± 2	^{20}621 ± 8	^{22}611 ± 31
105	intsysmsu-002	765921	^{111}786	^{44}1024 ± 0	^{112}593 ± 1	^{109}592 ± 2	^{102}592 ± 1	^{111}593 ± 1	^{13}549 ± 25	^{15}548 ± 29
106	iqface-000	268819	^{100}704	^{218}4750 ± 32	^{90}538 ± 26	^{76}488 ± 1	^{72}493 ± 1	^{76}487 ± 1	^{218}636433 ± 38446	^{218}632654 ± 85615
107	iqface-001	1145590	^{138}938	^{219}4752 ± 35	^{115}603 ± 1	^{73}463 ± 1	^{67}454 ± 21	^{73}458 ± 1	^{217}568761 ± 3659	^{217}570335 ± 5122
108	isap-001	99049	^{1}18	^{211}4096 ± 0	^{1}0 ± 0	-	-	-	^{4}459 ± 17	^{6}456 ± 11
109	isityou-000	48010	^{14}110	^{220}19200 ± 0	^{12}113 ± 5	^{8}96 ± 18	^{18}135 ± 68	^{10}123 ± 41	^{215}237517 ± 1318	^{215}237374 ± 1279
110	isystems-001	274621	^{153}1091	^{67}2048 ± 0	^{38}291 ± 9	^{34}261 ± 6	^{33}261 ± 15	^{34}261 ± 6	^{14}557 ± 16	^{18}564 ± 22
111	isystems-002	358984	^{184}1595	^{122}2048 ± 0	^{183}822 ± 8	^{158}789 ± 6	^{148}787 ± 16	^{159}788 ± 7	^{39}749 ± 31	^{29}632 ± 28
112	itmo-006	599187	^{179}1489	^{189}2121 ± 0	^{178}814 ± 1	^{167}807 ± 3	^{154}804 ± 6	^{167}806 ± 3	^{204}26154 ± 148	^{203}26217 ± 260
113	itmo-007	415979	^{198}2199	^{129}2048 ± 0	^{160}741 ± 2	^{155}769 ± 2	^{146}775 ± 26	^{153}750 ± 2	^{131}2551 ± 50	^{134}2529 ± 80
114	kakao-002	479406	^{90}603	^{151}2048 ± 0	^{161}747 ± 6	^{137}681 ± 3	^{122}672 ± 17	^{135}677 ± 3	^{106}1720 ± 62	^{103}1715 ± 83
115	kakao-003	414379	^{190}1754	^{102}2048 ± 0	^{195}878 ± 3	^{178}879 ± 1	^{167}877 ± 2	^{175}877 ± 2	^{117}2128 ± 34	^{119}2134 ± 60
116	kedacom-000	245292	^{219}23574	^{14}292 ± 0	^{82}506 ± 3	^{78}492 ± 1	^{1}1 ± 1	^{79}491 ± 2	^{27}684 ± 14	^{30}682 ± 16
117	kneron-003	58366	^{25}188	^{100}2048 ± 0	^{35}281 ± 3	^{37}276 ± 1	-	^{39}277 ± 1	^{165}5237 ± 63	^{166}5274 ± 99
118	kneron-005	375374	^{57}457	^{76}2048 ± 0	^{86}518 ± 2	^{86}514 ± 3	^{76}510 ± 5	^{86}514 ± 3	^{114}1922 ± 11	^{113}1926 ± 20
119	lookman-002	138200	^{217}16518	^{32}548 ± 0	^{18}173 ± 1	^{18}160 ± 1	^{3}1 ± 1	^{17}158 ± 1	^{17}610 ± 19	^{23}612 ± 22
120	lookman-004	244775	^{218}23548	^{31}548 ± 0	^{83}507 ± 5	^{79}494 ± 4	^{2}1 ± 1	^{78}490 ± 2	^{46}871 ± 29	^{47}878 ± 29
121	luxand-000	0	^{171}1366	^{46}1040 ± 0	^{66}407 ± 23	^{57}386 ± 14	^{54}386 ± 29	^{50}344 ± 13	^{45}828 ± 28	^{45}828 ± 32
122	megvii-001	1361523	^{174}1426	^{145}2048 ± 0	^{94}543 ± 0	-	-	-	^{164}5228 ± 32	^{164}5252 ± 60
123	megvii-002	1809564	^{194}1879	^{215}4100 ± 0	^{129}644 ± 0	-	-	-	^{209}50630 ± 183	^{209}47591 ± 716
124	meiya-001	280055	^{72}507	^{154}2049 ± 0	^{121}622 ± 12	^{102}559 ± 7	^{89}541 ± 24	^{100}553 ± 8	^{181}8356 ± 615	^{182}8134 ± 97
125	microfocus-001	104524	^{26}190	^{7}256 ± 0	^{31}264 ± 18	^{23}188 ± 7	^{20}144 ± 40	^{20}170 ± 8	^{1}215 ± 8	^{1}217 ± 10
126	microfocus-002	96288	^{22}176	^{5}256 ± 0	^{29}259 ± 18	^{22}185 ± 7	^{19}141 ± 36	^{19}167 ± 8	^{2}337 ± 34	^{2}230 ± 25
127	mt-000	372169	^{145}1056	^{153}2049 ± 0	^{158}724 ± 12	^{142}717 ± 2	^{135}717 ± 4	^{142}717 ± 2	^{103}1678 ± 47	^{99}1614 ± 85
128	mt-002	290753	^{123}844	^{152}2049 ± 0	^{103}573 ± 1	^{108}588 ± 4	^{97}571 ± 1	^{104}572 ± 1	^{179}7205 ± 204	^{176}7211 ± 244
129	mvision-001	227502	^{103}723	^{23}512 ± 0	^{150}691 ± 21	^{126}661 ± 12	^{116}657 ± 20	^{129}669 ± 14	^{74}1123 ± 40	^{80}1154 ± 38
130	nazhiai-000	547484	^{206}2716	^{119}2048 ± 0	^{149}683 ± 3	^{136}679 ± 1	^{126}678 ± 1	^{136}679 ± 1	^{121}2230 ± 34	^{118}2133 ± 81
131	netbridgetech-001	133108	^{73}508	^{205}4096 ± 0	^{5}85 ± 1	^{7}88 ± 0	^{10}86 ± 3	^{7}94 ± 1	^{184}9280 ± 74	^{184}9446 ± 512
132	neurotechnology-008	119718	^{99}694	^{8}256 ± 0	^{51}339 ± 0	^{45}337 ± 1	^{44}337 ± 1	^{48}337 ± 1	^{5}467 ± 19	^{9}486 ± 26

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	ALGORITHM	CONFIG	TEMPLATE						COMPARISON[4]	
	NAME	DATA	MEMORY	SIZE	GENERATION TIME (ms)[3]				TIME (ns)[4]	
		(KB)[1]	(MB)[2]	(B)	MUGSHOT	ISO	PHOTOJOURN.	WILD	GENUINE	IMPOSTOR
133	neurotechnology-009	137515	^{113}789	^{6}256 ± 0	^{58}388 ± 1	^{56}385 ± 1	^{53}385 ± 1	^{59}385 ± 1	^{11}513 ± 10	^{11}512 ± 16
134	nodeflux-002	774668	^{58}466	^{147}2048 ± 0	^{155}708 ± 4	^{140}710 ± 3	^{132}705 ± 3	^{140}711 ± 3	^{148}3475 ± 62	^{148}3408 ± 143
135	notiontag-000	92753	^{77}525	^{33}584 ± 0	^{96}548 ± 64	^{44}330 ± 20	^{36}269 ± 52	^{43}302 ± 23	^{208}44672 ± 269	^{208}44593 ± 358
136	ntech-007	2509686	^{215}5070	^{199}3348 ± 0	^{172}792 ± 3	^{159}789 ± 1	^{149}788 ± 2	^{161}791 ± 2	^{83}1209 ± 59	^{88}1267 ± 65
137	ntech-008	1138002	^{205}2707	^{52}1300 ± 0	^{99}556 ± 1	^{98}550 ± 1	^{90}549 ± 1	^{99}550 ± 1	^{69}1095 ± 45	^{64}1049 ± 51
138	paravision-004	556670	^{182}1572	^{203}4096 ± 0	^{185}829 ± 2	^{170}829 ± 1	^{160}825 ± 2	^{171}829 ± 2	^{38}737 ± 31	^{39}718 ± 38
139	pixelall-003	0	^{129}865	^{194}2560 ± 0	^{153}699 ± 8	^{132}672 ± 6	^{125}678 ± 30	^{130}669 ± 4	^{81}1174 ± 28	^{77}1139 ± 68
140	pixelall-004	0	^{81}529	^{192}2560 ± 0	^{74}451 ± 11	^{65}421 ± 7	^{64}440 ± 28	^{65}425 ± 12	^{76}1139 ± 65	^{84}1186 ± 31
141	psl-003	1159643	^{213}3960	^{188}2120 ± 0	^{192}865 ± 3	^{177}879 ± 4	^{150}789 ± 12	^{160}790 ± 2	^{61}1052 ± 14	^{61}1025 ± 51
142	psl-005	774031	^{199}2239	^{198}3144 ± 0	^{205}922 ± 37	^{183}926 ± 13	^{173}924 ± 21	^{183}926 ± 7	^{33}703 ± 32	^{35}708 ± 26
143	pxl-001	110116	^{20}168	^{26}512 ± 0	^{10}101 ± 5	^{5}79 ± 3	^{9}75 ± 6	^{5}78 ± 3	^{169}5598 ± 45	^{168}5590 ± 68
144	pyramid-000	372608	^{117}804	^{167}2056 ± 0	^{106}583 ± 2	-	-	-	^{177}7147 ± 59	^{179}7586 ± 425
145	rankone-008	2	^{7}70	^{4}165 ± 0	^{33}272 ± 3	^{32}251 ± 2	^{32}253 ± 11	^{33}260 ± 7	^{40}750 ± 20	^{24}613 ± 23
146	rankone-009	0	^{4}41	^{11}260 ± 0	^{21}179 ± 4	^{20}163 ± 3	^{23}172 ± 19	^{21}172 ± 8	^{34}710 ± 32	^{16}552 ± 25
147	realnetworks-002	95328	^{44}370	^{64}1848 ± 0	^{28}250 ± 2	^{30}234 ± 4	^{29}234 ± 8	^{28}231 ± 3	^{89}1285 ± 17	^{86}1247 ± 42
148	realnetworks-003	95334	^{37}345	^{63}1848 ± 0	^{20}177 ± 10	^{19}162 ± 2	^{21}163 ± 6	^{18}161 ± 2	^{98}1516 ± 29	^{96}1522 ± 60
149	remarkai-001	241857	^{104}730	^{161}2052 ± 0	^{186}831 ± 6	^{161}794 ± 8	^{147}787 ± 15	^{162}793 ± 8	^{85}1229 ± 20	^{44}805 ± 56
150	remarkai-001	224157	^{53}443	^{90}2048 ± 0	^{209}950 ± 6	^{190}968 ± 5	^{176}938 ± 24	^{191}997 ± 3	^{72}1115 ± 25	^{67}1068 ± 54
151	rokid-000	258612	^{160}1218	^{177}2056 ± 0	^{95}546 ± 3	^{85}514 ± 1	^{103}594 ± 15	^{83}511 ± 1	^{147}3457 ± 62	^{150}3463 ± 77
152	rokid-001	641223	^{148}1071	^{182}2060 ± 0	^{204}911 ± 2	^{181}902 ± 2	^{164}858 ± 71	^{172}851 ± 1	^{146}3345 ± 50	^{147}3346 ± 149
153	s1-001	435491	^{109}772	^{186}2092 ± 0	^{116}605 ± 24	^{93}530 ± 10	^{84}523 ± 21	^{94}529 ± 5	^{95}1428 ± 34	^{93}1415 ± 85
154	saffe-001	85973	^{21}168	^{51}1280 ± 0	^{34}281 ± 1	^{14}134 ± 1	^{11}98 ± 12	^{11}124 ± 1	^{87}1274 ± 19	^{89}1277 ± 26
155	saffe-002	260622	^{127}855	^{134}2048 ± 0	^{180}817 ± 11	^{162}794 ± 15	^{151}791 ± 31	^{165}802 ± 22	^{35}717 ± 7	^{38}714 ± 29
156	samtech-001	288082	^{91}605	^{172}2056 ± 0	^{40}294 ± 3	-	-	-	^{180}7694 ± 59	^{180}7678 ± 91
157	scanovate-001	257083	^{88}601	^{79}2048 ± 0	^{104}577 ± 24	-	-	-	^{186}12054 ± 699	^{190}13795 ± 705
158	scanovate-002	256986	^{125}850	^{148}2048 ± 0	^{151}696 ± 32	^{145}726 ± 25	^{130}697 ± 31	^{139}710 ± 16	^{142}3021 ± 38	^{144}3120 ± 163
159	sensetime-002	531783	^{196}2094	^{164}2052 ± 0	^{173}797 ± 3	^{144}718 ± 2	^{137}720 ± 7	^{144}717 ± 2	^{136}2713 ± 90	^{126}2301 ± 25
160	sensetime-003	787853	^{204}2519	^{163}2052 ± 0	^{202}908 ± 4	-	-	-	^{130}2527 ± 65	^{141}3004 ± 174
161	sertis-000	265572	^{49}427	^{74}2048 ± 0	^{163}754 ± 0	^{151}755 ± 0	^{143}755 ± 2	^{154}752 ± 0	^{97}1497 ± 29	^{98}1582 ± 38
162	shaman-000	0	^{71}507	^{209}4096 ± 0	^{135}653 ± 16	^{153}761 ± 76	^{114}639 ± 17	^{137}683 ± 37	^{3}380 ± 25	^{4}379 ± 31
163	shaman-001	0	^{75}511	^{202}4096 ± 0	^{41}294 ± 2	^{43}305 ± 9	^{5}8 ± 11	^{42}298 ± 6	^{24}635 ± 19	^{5}441 ± 25
164	shu-002	731250	^{131}890	^{201}4096 ± 0	^{162}751 ± 2	^{119}618 ± 1	^{136}718 ± 8	^{145}719 ± 1	^{221}2930763 ± 47355	^{221}2929759 ± 39149
165	shu-003	428774	^{74}511	^{115}2048 ± 0	^{182}820 ± 6	^{163}798 ± 3	^{153}798 ± 7	^{164}799 ± 2	^{129}2506 ± 26	^{132}2512 ± 38
166	siat-002	486842	^{201}2434	^{165}2052 ± 0	^{105}579 ± 0	^{107}579 ± 8	^{99}577 ± 3	^{106}575 ± 1	^{41}769 ± 13	^{41}750 ± 13
167	siat-004	940063	^{212}3860	^{214}4100 ± 0	^{141}670 ± 0	^{127}662 ± 2	^{117}663 ± 9	^{126}662 ± 3	^{158}4013 ± 45	^{155}3782 ± 173
168	sjtu-001	347115	^{52}438	^{71}2048 ± 0	^{131}650 ± 2	^{121}620 ± 1	^{108}615 ± 6	^{118}617 ± 1	^{220}2243804 ± 12751	^{220}2249915 ± 19380
169	sjtu-002	446215	^{82}538	^{137}2048 ± 0	^{187}835 ± 2	^{165}802 ± 3	^{152}794 ± 9	^{163}796 ± 1	^{219}2211198 ± 26052	^{219}2210428 ± 21877
170	smilart-002	111826	^{31}263	^{39}1024 ± 0	^{19}176 ± 16	^{9}112 ± 11	^{35}266 ± 158	^{51}349 ± 39	^{195}18784 ± 136	^{196}18795 ± 151
171	smilart-003	67339	^{28}192	^{19}512 ± 0	^{22}180 ± 12	^{15}139 ± 8	^{14}119 ± 22	^{13}136 ± 8	^{92}1395 ± 74	^{62}1027 ± 66
172	staqu-000	879661	^{147}1064	^{212}4096 ± 0	^{177}813 ± 25	-	-	-	^{140}2979 ± 31	^{142}3007 ± 75
173	starhybrid-001	100509	^{124}845	^{94}2048 ± 0	^{54}358 ± 82	^{41}293 ± 22	^{39}298 ± 27	^{41}284 ± 19	^{66}1075 ± 51	^{69}1078 ± 53
174	synesis-006	731941	^{178}1472	^{216}4104 ± 0	^{97}549 ± 1	^{97}549 ± 0	^{101}588 ± 1	^{109}589 ± 1	^{31}697 ± 32	^{33}688 ± 31
175	synesis-007	1442961	^{202}2443	^{197}3080 ± 0	^{221}1215 ± 5	^{193}1196 ± 7	^{182}1204 ± 5	^{193}1202 ± 4	^{28}684 ± 32	^{31}686 ± 25
176	synology-000	221021	^{55}453	^{80}2048 ± 0	^{65}407 ± 14	^{49}344 ± 7	^{43}333 ± 17	^{52}349 ± 9	^{198}19720 ± 203	^{197}19767 ± 379

Notes	
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2	The memory usage is the peak resident set size reported by the ps system call during template generation.
3	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
4	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 8: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	TEMPLATE						COMPARISON[4]	
	NAME	DATA	MEMORY	SIZE	GENERATION TIME (ms)[3]				TIME (ns)[4]	
		(KB)[1]	(MB)[2]	(B)	MUGSHOT	ISO	PHOTOJOURN.	WILD	GENUINE	IMPOSTOR
177	synology-001	256895	^{80}528	^{131}2048 ± 0	^{207}942 ± 21	^{176}877 ± 9	^{165}868 ± 20	^{174}875 ± 7	^{94}1402 ± 29	^{105}1730 ± 220
178	tech5-003	1427464	^{189}1745	^{54}1536 ± 0	^{196}885 ± 20	^{175}874 ± 5	^{170}899 ± 14	^{181}911 ± 8	^{78}1151 ± 37	^{76}1128 ± 32
179	tech5-004	2410272	^{207}2733	^{15}321 ± 0	^{193}872 ± 2	^{182}926 ± 10	^{172}908 ± 4	^{189}944 ± 2	^{16}597 ± 13	^{19}592 ± 16
180	tevian-004	863474	^{110}774	^{96}2048 ± 0	^{81}506 ± 30	^{66}426 ± 25	^{46}352 ± 47	^{56}369 ± 24	^{6}474 ± 31	^{3}326 ± 20
181	tevian-005	921043	^{150}1083	^{130}2048 ± 0	^{127}633 ± 21	^{111}592 ± 15	^{104}600 ± 45	^{123}646 ± 1	^{15}568 ± 22	^{21}607 ± 35
182	tiger-002	341638	^{76}522	^{174}2056 ± 0	^{63}393 ± 20	^{55}378 ± 21	^{50}364 ± 42	^{60}387 ± 22	^{119}2135 ± 29	^{120}2137 ± 38
183	tiger-003	426164	^{102}708	^{168}2056 ± 0	^{75}458 ± 21	^{68}436 ± 21	^{60}421 ± 41	^{69}438 ± 22	^{115}2031 ± 35	^{115}2029 ± 38
184	tongyi-005	1140701	^{197}2121	^{185}2089 ± 0	^{17}165 ± 1	-	-	-	^{196}18924 ± 65	^{198}20158 ± 103
185	toshiba-002	813606	-	^{58}1560 ± 0	^{92}541 ± 0	-	-	-	^{149}3521 ± 369	^{129}2449 ± 124
186	toshiba-003	984125	^{159}1197	^{59}1560 ± 0	^{91}540 ± 0	^{95}538 ± 2	^{168}882 ± 5	^{152}749 ± 4	^{127}2390 ± 41	^{128}2407 ± 81
187	trueface-000	255123	^{67}493	^{140}2048 ± 0	^{55}367 ± 8	^{50}356 ± 6	^{48}354 ± 11	^{53}355 ± 7	^{7}482 ± 13	^{14}528 ± 20
188	trueface-001	255123	^{97}638	^{16}500 ± 0	^{60}390 ± 1	^{51}358 ± 1	^{47}353 ± 6	^{54}355 ± 1	^{26}676 ± 26	^{17}558 ± 50
189	tuputech-000	11476	^{3}33	^{89}2048 ± 0	^{14}122 ± 4	^{10}114 ± 2	-	^{8}114 ± 3	^{200}23893 ± 406	^{200}25279 ± 406
190	ulsee-001	370519	-	^{133}2048 ± 0	^{136}654 ± 2	-	-	-	^{171}6065 ± 94	^{170}6228 ± 77
191	uluface-002	0	^{151}1088	^{111}2048 ± 0	^{194}873 ± 42	^{168}825 ± 7	^{158}818 ± 13	^{170}825 ± 7	^{197}19207 ± 1114	^{195}18501 ± 274
192	uluface-003	97357	^{163}1264	^{196}3072 ± 0	^{213}965 ± 11	^{186}937 ± 7	^{175}934 ± 16	^{187}938 ± 6	^{203}26057 ± 195	^{205}26865 ± 566
193	upc-001	0	^{149}1077	^{47}1052 ± 0	^{98}551 ± 15	^{96}541 ± 5	^{88}539 ± 10	^{98}546 ± 6	^{143}3114 ± 44	^{145}3165 ± 97
194	vcog-002	3229434	^{209}3666	^{221}61504 ± 5	^{53}357 ± 25	^{39}289 ± 22	^{40}313 ± 43	^{44}307 ± 28	^{216}296154 ± 3077	^{216}296436 ± 4183
195	visidon-001	170262	^{34}281	^{158}2052 ± 0	^{47}316 ± 6	-	-	-	^{86}1258 ± 38	^{79}1148 ± 109
196	veridas-003	293109	^{61}469	^{106}2048 ± 0	^{198}890 ± 33	^{125}659 ± 16	^{111}628 ± 46	^{124}654 ± 16	^{167}5484 ± 42	^{177}7306 ± 410
197	veridas-004	196585	^{62}472	^{150}2048 ± 0	^{146}678 ± 22	^{87}522 ± 9	^{74}499 ± 29	^{88}520 ± 12	^{168}5516 ± 42	^{178}7425 ± 130
198	via-000	124422	^{140}964	^{126}2048 ± 0	^{154}707 ± 8	^{128}662 ± 1	^{128}682 ± 36	^{114}603 ± 2	^{52}966 ± 28	^{60}1021 ± 44
199	via-001	370255	^{188}1697	^{86}2048 ± 0	^{212}964 ± 3	^{185}934 ± 5	^{179}965 ± 36	^{182}918 ± 3	^{55}983 ± 31	^{57}989 ± 40
200	videmo-000	139643	^{45}390	^{144}2048 ± 0	^{16}142 ± 5	^{13}133 ± 3	^{16}132 ± 6	^{12}136 ± 4	^{12}513 ± 16	^{12}523 ± 38
201	videonetics-001	30875	^{5}61	^{17}512 ± 0	^{30}262 ± 3	^{28}226 ± 4	-	^{26}223 ± 4	^{79}1153 ± 38	^{78}1142 ± 65
202	videonetics-002	121981	^{15}115	^{160}2052 ± 0	^{36}282 ± 5	^{29}231 ± 3	^{87}536 ± 444	^{27}226 ± 0	^{84}1219 ± 57	^{87}1262 ± 56
203	vigilant-006	343048	^{167}1316	^{57}1548 ± 0	^{188}841 ± 8	^{157}788 ± 13	^{157}817 ± 29	^{169}814 ± 21	^{47}939 ± 32	^{36}711 ± 37
204	vigilantsolutions-007	255600	^{133}912	^{56}1548 ± 0	^{80}493 ± 6	^{80}494 ± 3	^{75}499 ± 27	^{77}489 ± 3	^{43}803 ± 35	^{42}800 ± 40
205	vion-000	228219	^{69}498	^{159}2052 ± 0	^{50}333 ± 1	^{47}341 ± 1	-	^{47}337 ± 2	^{207}39839 ± 3561	^{204}26830 ± 2241
206	visionbox-000	176501	^{39}355	^{142}2048 ± 0	^{42}304 ± 7	^{33}252 ± 5	^{31}243 ± 12	^{32}250 ± 5	^{102}1648 ± 57	^{85}1192 ± 42
207	visionbox-001	256869	^{86}579	^{127}2048 ± 0	^{215}983 ± 7	^{184}933 ± 9	^{174}928 ± 20	^{184}932 ± 7	^{80}1161 ± 22	^{81}1154 ± 20
208	visionlabs-007	357204	^{32}266	^{22}512 ± 0	^{32}272 ± 0	^{31}246 ± 0	^{30}237 ± 5	^{30}242 ± 0	^{51}965 ± 41	^{53}972 ± 31
209	visionlabs-008	706099	^{54}446	^{24}512 ± 0	^{76}467 ± 1	^{67}434 ± 1	^{63}431 ± 10	^{67}431 ± 1	^{50}955 ± 23	^{51}962 ± 25
210	visteam-000	32729	^{11}83	^{55}1536 ± 0	^{7}96 ± 7	^{2}38 ± 4	^{7}27 ± 10	^{2}36 ± 4	^{173}6361 ± 87	^{173}6668 ± 277
211	vocord-007	587489	^{170}1352	^{61}1664 ± 0	^{169}780 ± 2	^{154}768 ± 2	^{144}765 ± 3	^{157}767 ± 2	^{134}2593 ± 83	^{133}2526 ± 59
212	vocord-008	603867	^{181}1559	^{195}2688 ± 0	^{211}962 ± 2	^{189}952 ± 2	^{178}949 ± 4	^{190}953 ± 2	^{141}3015 ± 50	^{140}2988 ± 62
213	winsense-000	270819	^{121}833	^{49}1280 ± 0	^{37}283 ± 1	^{35}262 ± 1	^{34}262 ± 4	^{35}265 ± 1	^{99}1551 ± 31	^{97}1532 ± 42
214	winsense-001	264428	^{136}922	^{50}1280 ± 0	^{167}766 ± 7	^{146}729 ± 4	^{138}726 ± 9	^{147}727 ± 4	^{101}1631 ± 28	^{114}1964 ± 171
215	x-laboratory-000	520020	^{180}1524	^{179}2056 ± 0	^{175}808 ± 7	^{166}804 ± 2	^{155}807 ± 2	^{168}812 ± 15	^{36}725 ± 19	^{40}749 ± 34
216	x-laboratory-001	625140	^{193}1844	^{175}2056 ± 0	^{108}586 ± 2	^{101}559 ± 1	^{85}530 ± 26	^{97}545 ± 1	^{44}813 ± 28	^{46}872 ± 32
217	xforwardai-000	242457	^{173}1392	^{66}2048 ± 0	^{164}757 ± 6	^{150}753 ± 6	^{142}752 ± 1	^{151}747 ± 1	^{82}1185 ± 44	^{83}1157 ± 44
218	yisheng-004	486351	^{166}1279	^{200}3704 ± 0	^{56}378 ± 12	^{54}375 ± 14	^{45}352 ± 16	^{55}367 ± 13	^{30}693 ± 137	^{13}526 ± 34
219	yitu-003	1525719	^{210}3737	^{183}2082 ± 0	^{191}860 ± 0	-	-	-	^{194}18305 ± 71	^{194}18286 ± 62
220	yoonik-000	290414	^{122}836	^{120}2048 ± 0	^{206}941 ± 3	^{187}937 ± 4	^{177}939 ± 3	^{188}938 ± 2	^{73}1116 ± 34	^{74}1113 ± 54

Notes	
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2	The memory usage is the peak resident set size reported by the ps system call during template generation.
3	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
4	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 9: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	TEMPLATE						COMPARISON[4]	
	NAME	DATA	MEMORY	SIZE	GENERATION TIME (ms)[3]				TIME (ns)[4]	
		(KB)[1]	(MB)[2]	(B)	MUGSHOT	ISO	PHOTOJOURN.	WILD	GENUINE	IMPOSTOR
221	yuan-000	370472	[185] 1605	[128] 2048 ± 0	[220] 1112 ± 6	[192] 1105 ± 3	[181] 1106 ± 3	[192] 1106 ± 2	[139] 2777 ± 44	[139] 2937 ± 87

Notes	
1	The configuration size does not capture static data included in libraries. We do not count these because some algorithms include common ancilliary libraries for image processing (e.g. OpenCV) or numerical computation (e.g. BLAS).
2	The memory usage is the peak resident set size reported by the ps system call during template generation.
3	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
4	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 10: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.			
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		WILD		CHILDEXP	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		0.0001		0.01	
1	3divi-003	0.0318	165	0.0588	162	0.0389	169	0.0639	166	0.0619	161	0.0928	118	0.0867	162	0.5365	32
2	3divi-004	0.0095	72	0.0153	73	0.0097	80	0.0145	78	0.0175	82	0.0330	76	0.0665	152	0.5025	25
3	acer-000	0.1393	192	0.9075	216	0.9981	217	-		1.0000	208	1.0000	203	0.9841	212	-	
4	acer-001	0.0294	159	0.0504	156	0.0240	151	0.0463	153	0.0436	146	0.0622	108	0.0307	77	-	
5	adera-001	0.1021	188	0.1757	184	0.1823	194	0.2967	192	0.1714	180	0.6357	169	0.1965	184	0.7202	61
6	advance-002	0.0089	65	0.0137	65	0.0073	47	0.0115	53	0.0400	138	0.0722	115	0.0498	136	-	
7	aifirst-001	0.0119	91	0.0170	81	0.0084	64	0.0127	61	0.0131	57	0.0212	44	0.0432	122	0.4301	17
8	ailabs-001	0.0158	123	0.0276	130	0.0192	139	0.0317	135	0.0352	133	0.0608	104	0.0338	102	-	
9	aimall-001	0.0176	132	0.0324	138	0.0225	145	0.0407	145	-		-		0.0344	103	0.6587	50
10	aimall-002	0.0119	90	0.0167	78	0.0224	143	0.0411	146	0.0233	105	0.0373	87	0.0327	93	-	
11	aiunionface-000	0.0104	78	0.0154	75	0.0082	62	0.0122	58	0.0141	59	0.0243	53	0.0306	75	-	
12	alchera-000	0.0165	126	0.0243	118	0.0125	108	0.0186	102	0.0204	96	0.0349	82	0.0370	109	-	
13	alchera-001	0.0183	133	0.0299	132	0.0142	116	0.0234	116	0.0239	109	0.0388	89	0.0372	110	-	
14	alleyes-000	0.0058	34	0.0090	38	0.0055	27	0.0087	35	0.0068	12	0.0105	10	0.0282	25	-	
15	allgovision-000	0.0346	166	0.0527	158	0.0232	147	0.0339	137	0.0372	136	0.0620	107	0.0607	148	-	
16	alphaface-001	0.0065	42	0.0097	43	0.0039	15	0.0063	19	0.0083	24	-		0.0280	15	-	
17	alphaface-002	0.0052	26	0.0075	26	0.0030	2	0.0044	5	1.0000	211	0.0115	14	0.0279	12	-	
18	amplifiedgroup-001	0.5034	210	0.5848	208	0.6973	209	0.8316	207	0.7807	198	0.7724	180	0.4250	201	-	
19	androvideo-000	0.0243	148	0.0438	152	0.0239	150	0.0365	142	0.0483	149	0.1870	138	0.1162	172	-	
20	anke-004	0.0080	58	0.0154	74	0.0073	46	0.0112	51	0.0102	42	0.0178	35	0.0288	42	0.3577	8
21	anke-005	0.0070	49	0.0109	53	0.0059	36	0.0094	38	0.0105	43	0.0142	24	0.0289	44	0.3337	6
22	antheus-000	0.2564	199	0.3776	199	0.7240	210	0.8699	210	0.8899	203	0.9872	194	0.7668	206	0.9233	83
23	antheus-001	0.1311	190	0.2306	191	0.5113	203	0.6797	202	0.8748	202	0.9908	195	0.7586	205	-	
24	anyvision-002	0.0660	181	0.0898	175	0.0928	186	0.1512	183	0.0899	168	0.1191	130	0.2227	188	0.6960	55
25	anyvision-004	0.0267	155	0.0385	149	0.0258	155	0.0487	158	0.0234	107	0.0301	65	0.0470	131	0.4633	20
26	asusaics-000	0.0125	98	0.0209	98	0.0085	65	0.0134	68	0.0143	61	0.7189	175	0.0295	55	-	
27	asusaics-001	0.0125	99	0.0210	99	0.0085	67	0.0134	69	0.0143	62	0.7437	178	0.0295	54	-	
28	aware-004	0.0690	182	0.0949	179	0.0837	184	0.1436	182	0.1171	174	0.8137	184	0.0516	138	-	
29	aware-005	0.0457	171	0.0643	167	0.0603	178	0.1094	175	0.0613	159	0.1075	129	0.0314	83	-	
30	awiros-001	0.4044	204	0.4622	202	0.5530	204	0.6518	201	0.2008	181	0.1994	139	0.5584	204	-	
31	ayftech-001	0.0946	186	0.1941	188	0.2438	196	0.3625	193	0.1558	178	0.1589	136	0.0785	157	-	
32	ayonix-000	0.4351	207	0.4872	203	0.6150	207	0.7510	205	0.6557	194	0.6361	170	0.3635	198	0.8434	73
33	bioidtechswiss-000	0.0066	44	0.0082	34	0.0113	96	0.0225	112	0.0078	19	0.0139	22	0.0278	10	-	
34	bm-001	0.7431	216	0.9494	218	0.9586	214	0.9843	212	0.9049	204	0.9021	190	0.9935	213	0.8845	79
35	camvi-002	0.0125	100	0.0221	106	0.0089	71	0.0145	80	0.0142	60	0.2650	145	0.0288	40	0.5760	39
36	camvi-004	0.0171	129	0.0316	137	0.0042	17	0.0049	13	0.0097	39	0.6636	171	0.0284	29	0.5788	41
37	ceiec-002	0.0161	125	0.0193	93	0.0122	105	0.0164	91	0.0270	116	0.0555	98	0.0465	130	0.5156	29
38	ceiec-003	0.0071	52	0.0107	51	0.0061	38	0.0079	29	0.0160	71	0.0316	68	0.0308	81	-	
39	chosun-000	0.8481	218	1.0000	222	1.0000	222	-		1.0000	218	1.0000	217	1.0000	221	-	
40	chosun-001	0.0525	173	0.0936	177	0.0742	182	0.1263	179	0.0978	173	1.0000	208	0.4446	203	-	
41	chtface-002	0.0150	116	0.0268	126	0.0096	79	0.0140	74	0.0186	87	0.0320	70	0.0306	76	-	
42	chtface-003	0.0091	67	0.0146	70	0.0083	63	0.0128	63	0.0132	58	0.0220	47	0.0301	67	-	
43	cib-000	0.0084	61	0.0156	76	0.0049	21	0.0051	14	0.0275	119	0.1371	133	0.0294	53	-	
44	cogent-003	0.0091	66	0.0188	90	0.0098	82	0.0132	66	0.0187	88	0.0319	69	0.0406	117	-	

Table 11: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. For child exploitation, missing entries arise because NIST executes those runs only infrequently. The VISA *columns compare images described in section 2.2. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.3 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* WILD *columns compare images described in section 2.6. The* CHILD-EXPLOITATION *columns compare images described in section 2.1.*

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.			
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		WILD		CHILDEXP	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		0.0001		0.01	
45	cogent-004	0.0064	40	0.0116	57	0.0096	78	0.0134	70	0.0157	67	0.0325	74	0.0379	112	0.7177	60
46	cognitec-000	0.0116	85	0.0177	82	0.0118	101	0.0167	93	0.0285	123	0.9924	196	0.0953	166	0.8365	72
47	cognitec-001	0.0126	101	0.0185	88	0.0120	103	0.0168	94	0.0270	115	0.0554	97	0.0598	147	-	
48	ctbcbank-000	0.0168	127	0.0250	122	0.0146	120	0.0224	111	0.0211	99	0.8964	189	1.0000	220	0.8803	77
49	ctbcbank-001	0.0155	119	0.0235	115	0.0148	125	0.0243	119	0.0207	97	0.9279	191	1.0000	223	-	
50	cuhkee-001	0.0036	9	0.0045	8	0.0031	5	0.0046	7	0.0051	7	0.0095	6	0.1492	178	-	
51	cyberextruder-001	0.1972	195	0.2547	192	0.4686	202	0.6387	200	0.3807	191	0.3806	155	0.1747	181	0.7804	70
52	cyberextruder-002	0.0811	183	0.1336	182	0.1465	192	0.2266	190	0.2086	183	1.0000	216	0.1000	168	0.6105	44
53	cyberlink-003	0.0118	87	0.0192	92	0.0098	83	0.0161	86	0.0153	64	0.0288	63	0.0303	70	-	
54	cyberlink-004	0.0074	57	0.0105	49	0.0068	44	0.0089	37	0.0094	35	0.0176	33	0.0283	26	-	
55	dahua-003	0.0052	27	0.0068	21	0.0056	31	0.0062	18	0.0113	49	0.0207	43	0.0285	33	0.6253	46
56	dahua-004	0.0045	20	0.0058	13	0.0036	11	0.0048	10	0.0051	5	0.0086	4	0.0281	18	-	
57	deepglint-001	0.0040	14	0.0062	19	0.0047	20	0.0067	21	0.0069	13	1.0000	206	0.0278	9	0.4006	12
58	deepglint-002	0.0016	2	0.0027	3	0.0032	7	0.0033	2	0.0043	2	0.0084	3	0.0280	14	0.3422	7
59	deepsea-001	0.0136	107	0.0215	103	0.0142	117	0.0214	108	0.0163	75	0.0250	54	0.0347	104	0.5606	36
60	dermalog-005	0.1526	194	0.1823	187	0.2580	197	0.4018	195	-		0.2651	146	0.0855	160	0.6842	52
61	dermalog-006	0.0253	153	0.0369	147	0.0171	133	0.0283	128	0.0217	101	0.0358	84	0.0623	150	0.5852	42
62	df-001	0.0275	156	0.0595	164	0.0300	163	0.0597	164	0.0486	150	0.4913	161	0.0759	154	-	
63	didiglobalface-001	0.0055	31	0.0092	39	0.0030	3	0.0045	6	0.0088	29	0.0119	15	0.0282	23	0.4270	15
64	digitalbarriers-002	0.3360	202	0.3690	197	0.0877	185	0.1557	184	0.0971	172	0.0951	121	0.0436	124	-	
65	dsk-000	0.1526	193	0.2169	189	0.3787	199	0.5426	198	0.3115	186	0.3089	151	0.2201	186	0.7313	63
66	einetworks-000	0.0099	74	0.0180	85	0.0088	70	0.0140	76	0.0130	55	0.0225	49	0.0293	50	-	
67	ercacat-001	0.0036	10	0.0044	7	0.0033	8	0.0047	8	0.0106	44	0.0202	42	0.0258	1	-	
68	everai-paravision-003	0.0034	8	0.0050	11	0.0036	14	0.0052	16	0.0092	33	0.0193	40	0.0278	11	0.2669	2
69	expasoft-000	0.0427	169	0.0655	169	0.0239	149	0.0393	143	0.0673	163	0.8963	188	0.0565	144	-	
70	f8-001	0.0249	152	0.0336	140	0.0178	136	0.0232	115	0.0303	128	0.0615	106	0.0475	133	0.5272	30
71	facesoft-000	0.0085	62	0.0112	56	0.0064	41	0.0107	46	0.0091	31	0.0171	31	0.0275	5	0.4992	24
72	fujitsulab-000	0.0123	94	0.0212	101	0.0091	72	0.0133	67	0.0251	112	0.4200	158	0.0445	127	-	
73	geo-000	0.0543	175	-		0.1042	187	0.1592	185	0.1637	179	0.8533	186	0.1211	174	-	
74	glory-001	0.0902	185	0.1082	181	0.1642	193	0.2065	189	0.2186	184	0.2669	147	0.4261	202	0.8831	78
75	glory-002	0.0241	145	0.0311	136	0.0116	98	0.0151	83	0.0157	69	0.0264	56	0.1265	175	-	
76	gorilla-004	0.0138	108	0.0239	117	0.0243	152	0.0444	149	0.0275	118	0.0369	85	0.0287	38	-	
77	gorilla-005	-		-		0.0142	118	0.0267	126	0.0228	104	0.0358	83	0.0307	78	-	
78	hik-001	0.0096	73	0.0125	62	0.0093	75	0.0164	90	0.0108	46	0.0937	119	0.0271	2	-	
79	hr-001	0.0044	19	0.0072	24	0.0073	49	0.0108	49	0.0125	52	0.0228	51	0.0303	69	0.5499	34
80	hr-002	0.0043	17	0.0059	14	0.0054	23	0.0076	26	0.0076	18	0.5932	167	0.0338	101	-	
81	icm-000	0.0846	184	0.1579	183	0.1252	191	0.2276	191	0.1340	176	0.1584	135	0.0439	125	-	
82	id3-003	0.0361	167	0.0757	172	0.0292	162	0.0476	155	0.0447	148	0.0674	112	0.0848	159	0.5865	43
83	id3-004	0.0198	138	0.0344	142	0.0238	148	0.0423	148	0.0289	124	0.0416	93	-		-	
84	idemia-005	0.0132	104	0.0216	104	0.0121	104	0.0218	110	0.0215	100	0.0323	73	0.0294	52	0.4343	18
85	idemia-006	0.0046	21	0.0062	20	0.0047	19	0.0066	20	0.0073	16	0.2882	149	0.0281	17	-	
86	iit-001	0.0104	79	0.0179	84	0.0099	85	0.0142	77	0.1222	175	0.2677	148	0.3092	197	0.4836	22
87	iit-002	0.0111	83	0.0177	83	0.0085	66	0.0140	75	0.0193	92	0.0332	79	0.1373	176	-	
88	imagus-000	0.0642	179	0.0882	173	0.0497	172	0.0905	170	0.0848	166	0.1026	126	0.1158	171	0.6936	54

Table 12: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. For child exploitation, missing entries arise because NIST executes those runs only infrequently. The VISA *columns compare images described in section 2.2. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.3 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* WILD *columns compare images described in section 2.6. The* CHILD-EXPLOITATION *columns compare images described in section 2.1.*

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.			
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		WILD		CHILDEXP	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		0.0001		0.01	
89	imagus-001	0.0245	149	0.0407	150	0.0257	154	0.0497	160	0.0514	153	0.0656	111	0.0971	167	-	
90	imperial-000	0.0067	46	0.0108	52	0.0080	59	0.0134	71	0.0087	28	0.0581	101	0.0281	20	-	
91	imperial-002	0.0058	33	0.0081	32	0.0055	29	0.0085	31	0.0083	25	0.0157	28	0.0273	3	0.5151	26
92	incode-005	0.0111	84	0.0189	91	0.0156	130	0.0304	133	0.0195	93	0.0307	66	0.0562	143	-	
93	incode-006	0.0156	120	0.0273	128	0.0117	99	0.0238	117	0.0202	95	0.0339	81	0.0325	91	-	
94	innovativetechnologyltd-001	0.0578	177	0.0938	178	0.0501	173	0.0981	171	-		-		0.0449	128	-	
95	innovativetechnologyltd-002	0.0451	170	0.0716	170	0.0541	175	0.1009	173	0.0506	152	0.0682	113	0.0804	158	-	
96	innovatrics-004	0.0194	136	0.0292	131	0.0344	165	0.0617	165	0.0562	156	0.0762	116	0.0454	129	0.4650	21
97	innovatrics-006	0.0058	35	0.0089	37	0.0061	39	0.0096	42	0.0096	38	0.0165	30	0.0281	16	0.3056	4
98	intellicloudai-001	0.0142	111	0.0234	113	0.0092	74	0.0145	79	0.0162	73	0.0371	86	0.0409	118	-	
99	intellifusion-001	0.0072	53	0.0094	41	0.0056	32	0.0085	32	0.0111	48	0.0212	45	0.0289	43	0.5454	33
100	intellifusion-002	0.0059	36	0.0077	28	0.0040	16	0.0074	23	0.0085	27	0.5352	163	0.0305	72	-	
101	intellivision-001	0.1335	191	0.2205	190	0.1090	189	0.1670	186	0.1385	177	0.1676	137	0.2445	189	0.7766	69
102	intellivision-002	0.1000	187	0.1775	185	0.0610	179	0.1009	172	0.0805	165	0.1074	128	0.0768	155	-	
103	intelresearch-000	0.0307	162	0.0578	161	0.0385	168	0.0751	169	0.0409	140	0.9870	193	0.0324	88	-	
104	intelresearch-001	0.0242	146	0.0595	165	0.0129	111	0.0292	131	0.0351	132	0.9993	200	0.0919	165	-	
105	intsysmsu-001	0.9543	221	0.9888	220	0.9923	215	-		0.9977	205	0.9955	197	0.7871	207	-	
106	intsysmsu-002	0.0130	102	0.0254	123	0.0137	113	0.0267	127	0.0160	70	0.0267	58	0.0289	45	-	
107	iqface-000	0.0091	69	0.0143	67	0.0075	53	0.0110	50	0.0171	81	0.2234	141	0.0381	113	0.6490	48
108	iqface-001	0.0088	64	0.0117	58	0.0177	134	0.0230	114	0.0165	77	0.5514	164	0.0597	146	-	
109	isap-001	0.5092	211	0.6588	210	0.6899	208	0.7978	206	0.7200	195	0.7253	176	0.1931	183	-	
110	isityou-000	0.5682	213	0.7033	212	1.0000	219	-		1.0000	212	1.0000	209	1.0000	216	1.0000	88
111	isystems-001	0.0149	115	0.0245	120	0.0138	115	0.0210	106	0.0209	98	0.0332	78	0.0524	141	0.5152	28
112	isystems-002	0.0118	86	0.0182	86	0.0111	92	0.0162	88	0.0166	78	0.0284	61	0.0516	139	0.4876	23
113	itmo-006	0.0125	97	0.0220	105	0.0149	126	0.0266	125	0.0233	106	0.0383	88	0.0329	95	-	
114	itmo-007	0.0080	59	0.0125	63	0.0107	88	0.0185	100	0.0167	79	0.0222	48	0.0300	64	-	
115	kakao-002	0.0625	178	0.1779	186	0.0791	183	0.1381	181	0.0636	162	1.0000	210	1.0000	218	1.0000	99
116	kakao-003	0.0130	103	0.0185	89	0.0261	158	0.0464	154	0.0252	113	0.2380	144	0.0274	4	-	
117	kedacom-000	0.0055	30	0.0081	33	0.0111	94	0.0120	57	0.0415	141	0.0966	124	0.2511	191	0.7650	67
118	kneron-003	0.0542	174	0.0902	176	0.0346	166	0.0562	163	0.0919	169	0.1251	132	0.3053	196	0.6962	56
119	kneron-005	0.0157	121	0.0259	125	0.0126	110	0.0212	107	0.0406	139	0.0693	114	0.0471	132	-	
120	lookman-002	0.0297	160	0.0547	160	0.0339	164	0.0562	162	0.0614	160	0.0960	123	0.2640	194	-	
121	lookman-004	0.0074	55	0.0099	45	0.0124	107	0.0149	82	0.0430	145	0.0866	117	0.2516	192	0.7664	68
122	luxand-000	0.2056	197	0.2814	193	0.4053	200	0.5365	197	0.3497	188	0.3743	153	0.2222	187	-	
123	megvii-001	0.0157	122	0.0244	119	0.0392	170	0.0671	168	0.0168	80	0.0455	94	0.0916	164	0.4418	19
124	megvii-002	0.0104	80	0.0145	69	0.0225	144	0.0345	138	0.0099	40	0.0286	62	0.0692	153	0.3013	3
125	meiya-001	0.0171	128	0.0275	129	0.0159	131	0.0261	124	0.0311	129	0.2250	142	0.0363	108	-	
126	microfocus-001	0.4482	208	0.5524	207	0.7256	211	0.8416	208	0.7301	196	0.6926	174	0.2567	193	0.6890	53
127	microfocus-002	0.3605	203	0.5057	204	0.5783	205	0.7223	203	0.5909	193	0.5963	168	0.1582	180	0.6517	49
128	mt-000	0.0100	75	0.0170	80	0.0074	52	0.0118	55	0.0127	53	0.0197	41	0.0326	92	0.3773	11
129	mt-002	0.0064	41	0.0085	35	0.0054	25	0.0098	43	0.0070	15	0.0108	11	0.0283	27	-	
130	mvision-001	0.0191	135	0.0233	111	0.0204	141	0.0356	139	0.0198	94	0.0337	80	0.0431	121	-	
131	nazhiai-000	0.0040	13	0.0059	15	0.0036	10	0.0048	12	0.0057	9	0.0125	16	0.0275	6	-	
132	netbridgetech-001	0.4749	209	0.6599	211	0.4438	201	0.5676	199	0.4491	192	1.0000	202	0.1098	170	-	

Table 13: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. For child exploitation, missing entries arise because NIST executes those runs only infrequently. The VISA *columns compare images described in section 2.2. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.3 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* WILD *columns compare images described in section 2.6. The* CHILD-EXPLOITATION *columns compare images described in section 2.1.*

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.			
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		WILD		CHILDEXP	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		0.0001		0.01	
133	neurotechnology-008	0.0091	68	0.0184	87	0.0076	55	0.0116	54	0.0157	68	0.9973	198	0.0301	66	-	
134	neurotechnology-009	0.0049	22	0.0087	36	0.0057	35	0.0094	39	0.0079	21	1.0000	204	0.0300	63	-	
135	nodeflux-002	-		-		0.0261	156	0.0451	152	-		-		0.0299	61	-	
136	nodeflux-002	0.0186	134	0.0340	141	0.0261	157	0.0451	151	0.0548	155	1.0000	207	0.0299	60	-	
137	notiontag-000	0.6669	214	0.7885	213	0.3715	198	0.4978	196	0.8571	200	0.8102	183	0.1807	182	0.6479	47
138	ntechlab-007	0.0056	32	0.0076	27	0.0073	50	0.0128	64	0.0079	20	0.0144	26	0.0276	8	0.3316	5
139	ntechlab-008	0.0041	16	0.0061	16	0.0056	30	0.0108	47	0.0042	1	0.0080	2	0.0289	47	-	
140	paravision-004	0.0030	7	0.0046	9	0.0030	4	0.0036	3	0.0091	32	0.0188	38	0.0288	41	0.2467	1
141	pixelall-003	0.0074	56	0.0118	59	0.0057	33	0.0079	28	0.0121	51	0.0390	90	0.0285	35	-	
142	pixelall-004	0.0040	15	0.0061	17	0.0055	28	0.0069	22	0.0100	41	0.5663	166	0.0285	32	-	
143	psl-003	0.0065	43	0.0099	46	0.0055	26	0.0075	24	1.0000	210	0.0188	39	0.0296	57	-	
144	psl-005	0.0060	38	0.0094	40	0.0034	9	0.0048	11	0.0081	22	0.0140	23	0.0281	19	-	
145	pxl-001	0.0488	172	0.0752	171	0.0586	177	0.1087	174	0.0946	170	0.1065	127	0.1088	169	-	
146	pyramid-000	0.0136	106	0.0233	112	0.0117	100	0.0192	104	0.0185	86	0.0322	72	0.0304	71	-	
147	rankone-008	0.0124	95	0.0232	110	0.0082	61	0.0107	45	0.0188	90	0.0320	71	0.0420	119	-	
148	rankone-009	0.0087	63	0.0119	60	0.0065	42	0.0086	34	0.0088	30	0.0161	29	0.0323	87	-	
149	realnetworks-002	0.0248	150	0.0358	144	0.0513	174	0.1127	176	0.0371	135	0.0614	105	0.0334	98	-	
150	realnetworks-003	0.0259	154	0.0372	148	0.0541	176	0.1208	178	0.0378	137	0.0578	100	0.0335	99	0.5152	27
151	remarkai-001	0.0144	112	0.0256	124	0.0102	86	0.0159	85	0.0162	74	0.0582	102	0.0308	80	-	
152	remarkai-002	0.0151	118	0.0197	94	0.0075	54	0.0108	48	0.0119	50	0.0187	37	0.0426	120	-	
153	rokid-000	0.0093	71	0.0145	68	0.0073	48	0.0102	44	0.0164	76	0.0280	60	0.0857	161	-	
154	rokid-001	0.0105	81	0.0162	77	0.0094	76	0.0163	89	0.0181	84	0.0276	59	0.0325	89	-	
155	s1-001	0.0314	164	0.0651	168	0.0252	153	0.0357	140	0.0444	147	0.0653	110	0.8493	208	-	
156	saffe-001	0.4339	206	0.5261	205	0.7539	213	0.8736	211	0.7977	199	0.9810	192	0.3887	199	0.8973	81
157	saffe-002	0.0119	92	0.0206	95	0.0107	90	0.0177	96	0.0244	110	0.9998	201	0.0308	79	-	
158	samtech-001	0.0197	137	0.0365	145	0.0146	123	0.0241	118	0.0238	108	0.0394	91	0.0337	100	-	
159	scanovate-001	0.0175	130	0.0331	139	0.0163	132	0.0248	120	0.2476	185	0.3801	154	0.4060	200	-	
160	scanovate-002	0.0175	131	0.0355	143	0.0146	121	0.0286	129	0.0269	114	0.0301	64	0.0301	68	-	
161	sensetime-002	0.0068	47	0.0098	44	0.0143	119	-		0.0278	121	0.0502	95	0.9999	214	0.5309	31
162	sensetime-003	0.0021	3	0.0027	2	0.0027	1	0.0027	1	0.0051	6	0.0100	8	0.0329	94	0.3683	9
163	sertis-000	0.0118	89	0.0211	100	-		-		-		-		-		-	
164	sertis-000	0.0118	88	0.0208	96	0.0080	58	0.0127	59	0.0110	47	0.0176	34	0.0285	34	-	
165	shaman-000	0.9297	220	0.9774	219	0.9990	218	-		0.9999	207	1.0000	205	0.9575	211	0.9618	84
166	shaman-001	0.3346	201	0.4616	201	0.2368	195	0.3723	194	0.3574	189	0.3527	152	0.1498	179	0.8990	82
167	shu-002	-		0.0079	30	0.0146	122	0.0308	134	1.0000	209	0.0183	36	0.0284	30	-	
168	shu-003	0.0028	5	0.0041	6	0.0050	22	0.0088	36	0.0081	23	0.0133	18	0.0283	28	-	
169	siat-002	0.0091	70	0.0126	64	0.0109	91	0.0190	103	0.0276	120	0.0516	96	0.0520	140	0.4277	16
170	siat-004	0.0067	45	0.0099	47	0.0152	128	-		0.0275	117	0.4823	160	1.0000	215	-	
171	sjtu-001	0.0051	25	0.0080	31	0.0211	142	0.0446	150	0.0131	56	0.0175	32	0.0289	46	-	
172	sjtu-002	0.0053	29	0.0078	29	0.0138	114	0.0296	132	0.0084	26	0.0136	20	0.0284	31	-	
173	smilart-002	0.2440	198	0.3532	196	-		-		0.3785	190	0.4145	157	-		0.6999	57
174	smilart-003	0.6944	215	0.8836	214	0.0695	180	0.1193	177	0.0894	167	0.1221	131	0.1190	173	-	
175	staqu-000	0.0139	109	0.0208	97	0.0104	87	0.0145	81	0.0156	66	0.8063	181	0.0332	97	-	
176	starhybrid-001	0.0108	82	0.0138	66	0.0081	60	0.0113	52	0.0152	63	0.0265	57	0.0350	106	0.5584	35

Table 14: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. For child exploitation, missing entries arise because NIST executes those runs only infrequently. The VISA *columns compare images described in section 2.2. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.3 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* WILD *columns compare images described in section 2.6. The* CHILD-EXPLOITATION *columns compare images described in section 2.1.*

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.			
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		WILD		CHILDEXP	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		0.0001		0.01	
177	synesis-006	0.0070	50	0.0096	42	0.0107	89	0.0166	92	-		0.0128	17	0.0292	49	-	
178	synesis-007	0.0050	23	0.0073	25	0.0062	40	0.0076	25	-		0.0105	9	0.0288	39	-	
179	synology-000	0.0149	114	0.0238	116	0.0148	124	0.0261	123	0.0221	102	0.0331	77	0.0330	96	-	
180	synology-001	0.0214	141	0.0307	134	0.0266	159	0.0513	161	0.0283	122	0.8884	187	0.0296	58	-	
181	tech5-003	0.0053	28	0.0070	22	0.0099	84	0.0185	99	0.0095	37	0.6670	172	0.0306	73	0.8963	80
182	tech5-004	0.0123	93	0.0234	114	0.0086	69	0.0162	87	0.0065	11	0.0112	12	0.0281	21	-	
183	tevian-004	0.0228	143	0.0304	133	0.0226	146	0.0478	156	0.0128	54	0.0228	50	0.0394	115	-	
184	tevian-005	0.0043	18	0.0062	18	0.0057	34	0.0085	33	0.0070	14	0.0135	19	0.0300	65	0.5625	38
185	tiger-002	0.0658	180	0.0889	174	0.1083	188	0.1766	187	0.0952	171	0.1568	134	0.0512	137	0.7862	71
186	tiger-003	0.0313	163	0.0602	166	0.0188	138	0.0359	141	0.0344	130	-		0.0482	135	0.5610	37
187	tongyi-005	0.0073	54	0.0146	71	0.0187	137	0.0421	147	0.0161	72	0.0215	46	0.0399	116	0.6195	45
188	toshiba-002	0.0134	105	0.0222	107	0.0097	81	0.0154	84	-		0.0327	75	0.0434	123	0.7103	58
189	toshiba-003	0.0125	96	0.0214	102	0.0085	68	0.0131	65	-		0.0241	52	0.0282	22	-	
190	trueface-000	0.0249	151	0.4321	200	0.0119	102	0.0180	98	0.0297	127	0.7467	179	0.0614	149	-	
191	trueface-001	0.0204	140	0.0438	153	0.0095	77	0.0138	73	0.0154	65	0.0253	55	0.0772	156	-	
192	tuputech-000	0.3218	200	0.3696	198	-		-		0.3237	187	0.4304	159	0.9415	210	-	
193	ulsee-001	0.0151	117	0.0246	121	0.0113	95	0.0185	101	0.0187	89	0.6766	173	0.0316	84	-	
194	uluface-002	0.0081	60	0.0123	61	0.0071	45	0.0095	41	0.0107	45	1.0000	215	0.0444	126	0.6729	51
195	uluface-003	0.0100	76	0.0150	72	0.0079	57	0.0128	62	-		-		0.0635	151	-	
196	upc-001	0.0234	144	0.0519	157	0.0291	161	0.0490	159	0.0294	125	0.2316	143	0.0314	82	0.4224	14
197	vcog-002	0.7522	217	0.9033	215	-		-		-		-		-		0.7523	65
198	vd-001	0.0243	147	0.0452	154	0.0271	160	0.0402	144	0.0424	144	-		0.1389	177	-	
199	veridas-003	0.0557	176	0.0983	180	0.0734	181	0.1267	180	0.0694	164	0.0951	122	0.0299	59	0.5785	40
200	veridas-004	0.0281	157	0.0467	155	0.0353	167	0.0643	167	0.0424	143	0.0644	109	0.0291	48	-	
201	via-000	0.0216	142	0.0365	146	0.0177	135	0.0287	130	0.0296	126	0.0572	99	0.0349	105	0.7638	66
202	via-001	0.0149	113	0.0229	109	0.0114	97	0.0177	97	0.0183	85	0.4056	156	0.0373	111	-	
203	videmo-000	0.0298	161	0.0423	151	0.0155	129	0.0260	122	0.0246	111	0.0397	92	0.0541	142	-	
204	videonetics-001	0.5483	212	0.6446	209	0.7517	212	0.8607	209	0.8664	201	0.8255	185	0.2986	195	0.7297	62
205	videonetics-002	0.4274	205	0.5329	206	0.6081	206	0.7438	204	0.7775	197	0.7297	177	0.1976	185	0.7435	64
206	vigilantsolutions-006	0.1264	189	0.3221	194	0.0150	127	0.0254	121	0.0493	151	0.2991	150	0.0321	86	-	
207	vigilantsolutions-007	0.0202	139	0.0307	135	0.0136	112	0.0227	113	0.0356	134	1.0000	222	0.0306	74	1.0000	205
208	vion-000	0.0419	168	0.0590	163	0.0422	171	0.0478	157	0.0581	158	0.0968	125	0.2479	190	0.8765	76
209	visionbox-000	0.0293	158	0.0541	159	0.0197	140	0.0339	136	0.0349	131	0.0593	103	0.0476	134	-	
210	visionbox-001	0.0159	124	0.0270	127	0.0111	93	0.0173	95	0.0190	91	0.0315	67	0.0389	114	-	
211	visionlabs-007	0.0038	11	0.0048	10	0.0036	12	0.0048	9	0.0057	8	0.0097	7	0.0286	37	0.3708	10
212	visionlabs-008	0.0026	4	0.0036	4	0.0031	6	0.0040	4	0.0045	3	0.0079	1	0.0282	24	-	
213	visteam-000	0.9200	219	0.9489	217	0.9959	216	-		0.9994	206	0.9978	199	0.8783	209	-	
214	vocord-007	0.0039	12	0.0053	12	0.0061	37	0.0094	40	0.0520	154	0.0939	120	0.0280	13	0.8468	74
215	vocord-008	0.0029	6	0.0038	5	0.0042	18	0.0055	17	0.0045	4	0.0086	5	0.0286	36	-	
216	winsense-000	0.0140	110	0.0228	108	0.0125	109	0.0215	109	0.0226	103	0.8091	182	0.0352	107	0.8600	75
217	winsense-001	0.0062	39	0.0099	48	0.0092	73	0.0210	105	0.0093	34	0.0144	27	0.0320	85	0.4155	13
218	x-laboratory-000	0.0071	51	0.0106	50	0.0123	106	0.0138	72	0.0419	142	0.5629	165	0.0295	56	0.9686	85
219	x-laboratory-001	0.0059	37	0.0110	54	0.0054	24	0.0078	27	0.0094	36	0.0142	25	0.0294	51	-	
220	xforwardai-000	0.0050	24	0.0072	23	0.0036	13	0.0051	15	0.0074	17	0.0136	21	0.0276	7	-	

Table 15: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. For child exploitation, missing entries arise because NIST executes those runs only infrequently. The VISA *columns compare images described in section 2.2. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.3 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* WILD *columns compare images described in section 2.6. The* CHILD-EXPLOITATION *columns compare images described in section 2.1.*

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.			
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		WILD		CHILDEXP	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		0.0001		0.01	
221	yisheng-004	0.1988	196	0.3329	195	0.1147	190	0.1849	188	0.2044	182	-		0.0908	163	0.7152	59
222	yitu-003	0.0015	1	0.0026	1	0.0066	43	0.0085	30	0.0064	10	0.0114	13	0.0325	90	-	
223	yoonik-000	0.0070	48	0.0112	55	0.0074	51	0.0118	56	0.0564	157	0.2013	140	0.0590	145	-	
224	yuan-000	0.0101	77	0.0168	79	0.0077	56	0.0127	60	0.0178	83	0.5189	162	0.0299	62	-	

Table 16: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. For child exploitation, missing entries arise because NIST executes those runs only infrequently. The VISA *columns compare images described in section 2.2. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.3 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* WILD *columns compare images described in section 2.6. The* CHILD-EXPLOITATION *columns compare images described in section 2.1.*

Figure 1: The points show false non-match rates (FNMR) versus the size of the encoded template. FNMR is the geometric mean of FNMR values for visa and mugshot images (from Figs. 35 and 46) at a false match rate (FMR) of 0.0001. The color of the points encodes template generation time - which spans at least one order of magnitude. Durations are measured on a single core of a c. 2016 Intel Xeon CPU E5-2630 v4 running at 2.20GHz. Algorithms with poor FNMR are omitted.

Figure 2: The points show false non-match rates (FNMR) versus the duration of the template generation operation. FNMR is the geometric mean of FNMR values for visa and mugshot images (from Figs. 35 and 46) at a false match rate (FMR) of 0.0001. Template generation time is a median estimated over 640 x 480 pixel portraits. It is measured on a single core of a c. 2016 Intel Xeon CPU E5-2630 v4 running at 2.20GHz. The color of the points encodes template size - which span two orders of magnitude. Algorithms with poor FNMR are omitted.

1 Metrics

1.1 Core accuracy

Given a vector of N genuine scores, u, the false non-match rate (FNMR) is computed as the proportion below some threshold, T:

$$\text{FNMR}(T) = 1 - \frac{1}{N}\sum_{i=1}^{N} H(u_i - T) \tag{1}$$

where $H(x)$ is the unit step function, and $H(0)$ taken to be 1.

Similarly, given a vector of N impostor scores, v, the false match rate (FMR) is computed as the proportion above T:

$$\text{FMR}(T) = \frac{1}{N}\sum_{i=1}^{N} H(v_i - T) \tag{2}$$

The threshold, T, can take on any value. We typically generate a set of thresholds from quantiles of the observed impostor scores, v, as follows. Given some interesting false match rate range, $[\text{FMR}_L, \text{FMR}_U]$, we form a vector of K thresholds corresponding to FMR measurements evenly spaced on a logarithmic scale

$$T_k = Q_v(1 - \text{FMR}_k) \tag{3}$$

where Q is the quantile function, and FMR_k comes from

$$\log_{10}\text{FMR}_k = \log_{10}\text{FMR}_L + \frac{k}{K}\,[\log_{10}\text{FMR}_U - \log_{10}\text{FMR}_L] \tag{4}$$

Error tradeoff characteristics are plots of FNMR(T) vs. FMR(T). These are plotted with $\text{FMR}_U \to 1$ and FMR_L as low as is sustained by the number of impostor comparisons, N. This is somewhat higher than the "rule of three" limit $3/N$ because samples are not independent, due to re-use of images.

2 Datasets

2.1 Child exploitation images

- ▷ The number of images is on the order of 10^4.
- ▷ The number of subjects is on the order of 10^3.
- ▷ The number of subjects with two images on the order of 10^3.
- ▷ The images are operational. They are taken from ongoing investigations of child exploitation crimes. The images are arbitrarily unconstrained. Pose varies considerably around all three axes, including subject lying down. Resolution varies very widely. Faces can be occluded by other objects, including hair and hands. Lighting varies, although the images are intended for human viewing. Mis-focus is rare. Images are given to the algorithm without any cropping; faces may occupy widely varying areas.
- ▷ The images are usually large from contemporary cameras. The mean interocular distance (IOD) is 70 pixels.
- ▷ The images are of subjects from several countries, due to the global production of this imagery.
- ▷ The images are of children, from infancy to late adolescence.
- ▷ All of the images are live capture, none are scanned. Many have been cropped.
- ▷ When these images are input to the algorithm, they are labelled as being of type "EXPLOITATION" - see Table 4 of the FRVT API.

2.2 Visa images

- ▷ The number of images is on the order of 10^5.
- ▷ The number of subjects is on the order of 10^5.
- ▷ The number of subjects with two images is on the order of 10^4.
- ▷ The images have geometry in reasonable conformance with the ISO/IEC 19794-5 Full Frontal image type. Pose is generally excellent.
- ▷ The images are of size 252x300 pixels. The mean interocular distance (IOD) is 69 pixels.
- ▷ The images are of subjects from greater than 100 countries, with significant imbalance due to visa issuance patterns.
- ▷ The images are of subjects of all ages, including children, again with imbalance due to visa issuance demand.
- ▷ Many of the images are live capture. A substantial number of the images are photographs of paper photographs.
- ▷ When these images are input to the algorithm, they are labelled as being of type "ISO" - see Table 4 of the FRVT API.

2.3 Application images

- ▷ The number of images is on the order of 10^6.
- ▷ The number of subjects is on the order of 10^6.
- ▷ The number of subjects with two images is on the order of 10^6.
- ▷ The images have geometry in good conformance with the ISO/IEC 19794-5 Full Frontal image type. Pose is generally excellent.
- ▷ The images are of size 300x300 pixels. The mean interocular distance (IOD) is 61 pixels.
- ▷ The images are of subjects from greater than 100 countries, with significant imbalance due to population and immigration patterns.

- ▷ The images are of subjects of adults with imbalance due due to population and immigration patterns and demand.
- ▷ All of the images are live capture.
- ▷ When these images are input to the algorithm, they are labelled as being of type "ISO" - see Table 4 of the FRVT API.

2.4 Border crossing images

- ▷ The number of images is on the order of 10^6.
- ▷ The number of subjects is on the order of 10^6.
- ▷ The number of subjects with two images is on the order of 10^6.
- ▷ The images are taken with at camera oriented by an attendant toward a cooperating subject. This is done under time constraints so there are role, pitch and yaw angle variations. Also background illumination is sometimes strong, so the face is under-exposed. There is some perspective distortion due to close range images. Some faces are partially cropped.
- ▷ The images are of subjects from greater than 100 countries, with significant imbalance due to population and immigration patterns.
- ▷ The images are of subjects of adults with imbalance due due to population and immigration patterns and demand.
- ▷ The images have mean IOD of 38 pixels.
- ▷ The images are all live capture.
- ▷ When these images are input to the algorithm, they are labelled as being of type "WILD" - see Table 4 of the FRVT API.

2.5 Mugshot images

- ▷ The number of images is on the order of 10^6.
- ▷ The number of subjects is on the order of 10^6.
- ▷ The number of subjects with two images is on the order of 10^6.
- ▷ The images have geometry in reasonable conformance with the ISO/IEC 19794-5 Full Frontal image type.
- ▷ The images are of variable sizes. The median IOD is 105 pixels. The mean IOD is 113 pixels. The 1-st, 5-th, 10-th, 25-th, 75-th, 90-th and 99-th percentiles are 34, 58, 70, 87, 121, 161 and 297 pixels.
- ▷ The images are of subjects from the United States.
- ▷ The images are of adults.
- ▷ The images are all live capture.
- ▷ When these images are input to the algorithm, they are labelled as being of type "mugshot" - see Table 4 of the FRVT API.

2.6 Wild images

- ▷ The number of images is on the order of 10^5.
- ▷ The number of subjects is on the order of 10^3.
- ▷ The number of subjects with two images on the order of 10^3.
- ▷ The images include many photojournalism-style images. Images are given to the algorithm using a variable but generally tight crop of the head. Resolution varies very widely. The images are very unconstrained, with wide yaw and pitch pose variation. Faces can be occluded, including hair and hands.

(a) Visa (b) Mugshot (c) Wild (d) Border

Figure 3: The figure gives simulated samples of image types used in this report.

- ▷ The images are of adults.
- ▷ All of the images are live capture, none are scanned.
- ▷ When these images are input to the algorithm, they are labelled as being of type "WILD" - see Table 4 of the FRVT API.

3 Results

3.1 Test goals

- ▷ To state absolute accuracy for different kinds of images, including those with and without subject cooperation.
- ▷ To state comparative accuracy, across algorithms.

3.2 Test design

Method: For visa images:

- ▷ The comparisons are of visa photos against visa photos.
- ▷ The number of genuine comparisons is on the order of 10^4.
- ▷ The number of impostor comparisons is on the order of 10^{10}.
- ▷ The comparisons are fully zero-effort, meaning impostors are paired without attention to sex, age or other covariates. However, later analysis is conducted on subsets.
- ▷ The number of persons is on the order of 10^5.
- ▷ The number of images used to make 1 template is 1.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.

Method: For mugshot images:

- ▷ The comparisons are of mugshot photos against mugshot photos.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- ▷ The number of genuine comparisons is on the order of 10^6.
- ▷ The number of impostor comparisons is on the order of 10^8.
- ▷ The impostors are paired by sex, but not by age or other covariates.
- ▷ The number of persons is on the order of 10^6.
- ▷ The number of images used to make 1 template is 1.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.

Method: For visa-border comparisons:

- ▷ The comparisons are of visa-like frontals against border crossing webcam photos.
- ▷ The number of genuine comparisons is on the order of 10^6.
- ▷ The number of impostor comparisons is on the order of 10^8.
- ▷ The impostors are paired by sex, but not by age or other covariates.
- ▷ The number of persons is on the order of 10^6.
- ▷ The number of images used to make 1 template is 1.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.

Method: For border-border comparisons:

- ▷ The comparisons are of border crossing webcam photos.
- ▷ The number of genuine comparisons is on the order of 10^6.
- ▷ The number of impostor comparisons is on the order of 10^8.
- ▷ The impostors are paired by sex, but not by age or other covariates.
- ▷ The number of persons is on the order of 10^6.
- ▷ The number of images used to make 1 template is 1.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.

Method: For wild images:

- ▷ The comparisons are of wild photos against wild photos.
- ▷ The number of genuine comparisons is on the order of 10^6.
- ▷ The number of impostor comparisons is on the order of 10^7.
- ▷ The comparisons are fully zero-effort, meaning impostors are paired without attention to sex, age or other covariates.
- ▷ The number of persons is on the order of 10^4.
- ▷ The number of images used to make 1 template is 1.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.

Method: For child exploitation images:

- ▷ The comparisons are of unconstrained child exploitation photos against others of the same type.

- ▷ The number of genuine comparisons is on the order of 10^4.
- ▷ The number of impostor comparisons is on the order of 10^7.
- ▷ The comparisons are fully zero-effort, meaning impostors are paired without attention to sex, age or other covariates.
- ▷ The number of persons is on the order of 10^3.
- ▷ The number of images used to make 1 template is 1.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.
- ▷ We produce two performance statements. First, is a DET as used for visa and mugshot images. The second is a cumulative match characteristic (CMC) summarizing a simulated one-to-many search process. This is done as follows.
  - We regard M enrollment templates as items in a gallery.
  - These M templates come from $M > N$ individuals, because multiple images of a subject are present in the gallery under separate identifiers.
  - We regard the verification templates as search templates.
  - For each search we compute the rank of the highest scoring mate.
  - This process should properly be conducted with a 1:N algorithm, such as those tested in NIST IR 8009. We use the 1:1 algorithms in a simulated 1:N mode here to a) better reflect what a child exploitation analyst does, and b) to show algorithm efficacy is better than that revealed in the verification DETs.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.3 Failure to enroll

	Algorithm	Failure to Enrol Rate[1]											
	Name	APPLICATION		BORDER		CHILD-EXPLOIT		MUGSHOT		VISA		WILD	
	Name	SEC. 2.3		SEC. 2.4		SEC. 2.1		SEC. 2.5		SEC. 2.2		SEC. 2.6	
1	3divi-003	0.0001	187	0.0059	189	0.1806	66	0.0007	172	0.0006	167	0.0294	191
2	3divi-004	0.0001	186	0.0059	190	0.2302	74	0.0008	177	0.0006	169	0.0222	185
3	acer-000	0.0000	157	0.0024	145	-	234	0.0002	126	0.0004	141	0.0008	121
4	acer-001	0.0000	124	0.0011	112	-	234	0.0001	89	0.0004	124	0.0004	89
5	adera-001	0.0000	156	0.0034	162	0.1928	68	0.0003	141	0.0005	161	0.0505	203
6	advance-002	0.0000	90	0.0013	124	-	234	0.0000	78	0.0004	121	0.0009	130
7	aifirst-001	0.0000	3	0.0000	3	0.0000	2	0.0000	3	0.0000	3	0.0000	51
8	ailabs-001	0.0000	99	0.0090	196	-	234	0.0007	176	0.0005	148	0.0016	143
9	aimall-001	0.0000	31	0.0000	23	0.0000	11	0.0000	22	0.0000	24	0.0001	59
10	aimall-002	0.0000	159	0.0043	172	-	234	0.0012	191	0.0005	159	0.0005	106
11	aiunionface-000	0.0000	46	0.0000	32	-	234	0.0000	30	0.0000	34	0.0000	54
12	alchera-000	0.0000	179	0.0041	171	-	234	0.0004	152	0.0014	200	0.0038	152
13	alchera-001	0.0000	178	0.0041	170	-	234	0.0004	151	0.0014	199	0.0038	151
14	alleyes-000	0.0000	108	0.0010	103	-	234	0.0002	120	0.0004	130	0.0004	97
15	allgovision-000	0.0007	209	0.0062	191	-	234	0.0026	205	0.0052	217	0.0131	173
16	alphaface-001	0.0000	104	0.0012	117	-	234	0.0000	81	0.0004	129	0.0004	82
17	alphaface-002	0.0000	109	0.0012	118	-	234	0.0000	82	0.0004	131	0.0004	84
18	amplifiedgroup-001	0.0114	218	0.1023	217	-	234	0.0189	219	0.0279	223	0.1390	217
19	androvideo-000	0.0000	25	0.0000	18	-	234	0.0000	17	0.0000	18	0.0002	63
20	anke-004	0.0000	98	0.0011	111	0.0944	54	0.0001	104	0.0004	132	0.0006	112
21	anke-005	0.0000	101	0.0012	119	0.1228	60	0.0001	114	0.0004	140	0.0007	115
22	antheus-000	0.0000	73	0.0000	51	0.0000	27	0.0000	50	0.0000	56	0.0242	186
23	antheus-001	0.0000	86	0.0000	59	-	234	0.0000	57	0.0000	63	0.0242	187
24	anyvision-002	0.0060	216	0.0230	202	0.4866	90	0.0070	216	0.0090	220	0.1146	212
25	anyvision-004	0.0000	150	0.0017	132	0.1660	63	0.0001	113	0.0004	118	0.0080	160
26	asusaics-000	0.0000	33	0.0000	25	-	234	0.0000	24	0.0000	26	0.0000	19
27	asusaics-001	0.0000	87	0.0000	60	-	234	0.0000	58	0.0000	64	0.0000	48
28	aware-004	0.0000	131	0.0023	143	-	234	0.0002	123	0.0005	147	0.0014	141
29	aware-005	0.0000	137	0.0020	140	-	234	0.0001	119	0.0004	135	0.0011	136
30	awiros-001	0.0039	212	0.0369	211	-	234	0.0386	220	0.0872	224	0.3415	221
31	ayftech-001	0.0002	199	0.0046	178	-	234	0.0043	210	0.0011	187	0.0091	165
32	ayonix-000	0.0053	215	0.0341	210	0.0000	20	0.0113	217	0.0137	222	0.1194	213
33	bioidtechswiss-000	0.0000	117	0.0008	92	-	234	0.0003	139	0.0004	144	0.0006	107
34	bm-001	0.0000	34	0.0000	26	0.0000	13	0.0000	61	0.0000	27	0.0000	20
35	camvi-002	0.0000	53	0.0000	38	0.0000	21	0.0000	36	0.0000	40	0.0000	30
36	camvi-004	0.0000	61	0.0000	63	0.0000	23	0.0000	41	0.0000	46	0.0000	36
37	ceiec-002	0.0002	198	0.0056	186	0.2482	78	0.0036	209	0.0031	213	0.0081	161
38	ceiec-003	0.0000	22	0.0013	125	-	234	0.0001	91	0.0004	127	0.0004	79
39	chosun-000	0.0000	15	0.0000	12	-	234	0.0000	11	0.0000	12	0.0000	10
40	chosun-001	0.0000	76	0.0000	53	-	234	0.0000	52	0.0000	58	0.0000	44
41	chtface-002	0.0000	162	0.0021	142	-	234	0.0002	136	0.0007	172	0.0014	140
42	chtface-003	0.0000	154	0.0018	134	-	234	0.0001	98	0.0006	166	0.0010	134
43	cib-000	0.0000	57	0.0000	40	-	234	0.0001	116	0.0000	42	0.0000	32
44	cogent-003	0.0000	153	0.0018	135	-	234	0.0001	97	0.0004	115	0.0009	133
45	cogent-004	0.0000	6	0.0000	6	0.0000	3	0.0000	5	0.0000	6	0.0000	4
46	cognitec-000	0.0005	207	0.0112	199	0.6342	94	0.0007	173	0.0007	176	0.0388	199
47	cognitec-001	0.0003	203	0.0110	198	-	234	0.0008	181	0.0010	179	0.0185	181
48	ctbcbank-000	0.0001	185	0.0051	181	0.3285	83	0.0011	188	0.0019	204	0.0868	211
49	ctbcbank-001	0.0000	163	0.0036	166	-	234	0.0005	165	0.0010	180	0.0844	210
50	cuhkee-001	0.0000	100	0.0011	115	-	234	0.0000	64	0.0004	111	0.1278	214
51	cyberextruder-001	0.0029	211	0.0293	204	0.5338	92	0.0024	203	0.0029	211	0.0597	207
52	cyberextruder-002	0.0013	210	0.0840	216	0.2672	81	0.0027	206	0.0028	210	0.0335	196
53	cyberlink-003	0.0000	21	0.0007	88	-	234	0.0001	88	0.0004	100	0.0008	123
54	cyberlink-004	0.0000	121	0.0010	110	-	234	0.0004	149	0.0003	87	0.0003	73
55	dahua-003	0.0000	64	0.0019	136	0.2222	73	0.0002	131	0.0003	74	0.0002	65
56	dahua-004	0.0000	37	0.0009	102	-	234	0.0001	112	0.0003	71	0.0002	66
57	deepglint-001	0.0000	36	0.0000	27	0.0000	14	0.0000	25	0.0000	28	0.0000	21
58	deepglint-002	0.0000	89	0.0004	72	0.0669	48	0.0002	132	0.0004	102	0.0003	72

Table 17: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.

[1] *The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

	Algorithm	Failure to Enrol Rate[1]											
	Name	APPLICATION		BORDER		CHILD-EXPLOIT		MUGSHOT		VISA		WILD	
	Name	SEC. 2.3		SEC. 2.4		SEC. 2.1		SEC. 2.5		SEC. 2.2		SEC. 2.6	
59	deepsea-001	0.0000	11	0.0000	10	0.0000	6	0.0000	9	0.0000	10	0.0000	8
60	dermalog-005	-	234	0.0031	154	0.1796	64	0.0013	195	0.0041	214	0.0163	179
61	dermalog-006	0.0005	208	0.0031	155	0.1797	65	0.0013	194	0.0041	215	0.0163	180
62	didiglobalface-001	0.0000	103	0.0012	116	0.2175	71	0.0000	80	0.0004	128	0.0004	81
63	digitalbarriers-002	0.0001	190	0.0045	175	-	234	0.0028	207	0.0027	209	0.0071	159
64	dsk-000	0.0000	23	0.0000	16	0.0000	9	0.0000	15	0.0000	16	0.0000	14
65	einetworks-000	0.0000	164	0.0017	131	-	234	0.0002	129	0.0005	158	0.0008	125
66	ercacat-001	0.0000	80	0.0005	78	-	234	0.0000	74	0.0003	81	0.0002	67
67	everai-paravision-003	0.0000	132	0.0008	99	0.0705	50	0.0002	122	0.0004	101	0.0004	95
68	expasoft-000	0.0000	82	0.0000	56	-	234	0.0000	54	0.0000	60	0.0000	47
69	f8-001	0.0003	202	0.0059	188	0.2026	70	0.0035	208	0.0030	212	0.0087	164
70	facesoft-000	0.0000	88	0.0000	61	0.0000	29	0.0000	59	0.0000	65	0.0000	49
71	fujitsulab-000	0.0000	173	0.0033	158	-	234	0.0005	160	0.0002	68	0.0099	167
72	geo-000	0.0000	30	0.0000	22	-	234	0.0000	21	0.0000	23	0.0000	17
73	glory-001	0.0160	219	0.0314	208	0.0000	26	0.0051	213	0.0010	182	0.1651	218
74	glory-002	0.0003	200	0.0045	174	-	234	0.0015	197	0.0011	194	0.0557	205
75	gorilla-004	0.0000	77	0.0008	97	-	234	0.0000	69	0.0003	80	0.0004	90
76	gorilla-005	0.0000	44	0.0008	98	-	234	0.0000	68	0.0003	78	0.0004	87
77	hik-001	0.0000	66	0.0000	64	-	234	0.0000	44	0.0000	49	0.0000	39
78	hr-001	0.0000	92	0.0007	90	0.1198	59	0.0001	85	0.0004	106	0.0003	77
79	hr-002	0.0000	102	0.0007	89	-	234	0.0002	128	0.0004	133	0.0004	80
80	icm-000	0.0000	28	0.0000	20	-	234	0.0000	19	0.0000	21	0.0000	16
81	id3-003	0.0001	184	0.0052	183	0.3032	82	0.0016	200	0.0011	193	0.0317	193
82	id3-004	0.0000	181	0.0052	182	-	234	0.0015	199	0.0011	192	-	234
83	idemia-005	0.0000	9	0.0004	73	0.0239	33	0.0000	65	0.0003	82	0.0003	70
84	idemia-006	0.0000	56	0.0004	74	-	234	0.0000	66	0.0003	84	0.0003	71
85	iit-001	0.0000	144	0.0806	215	0.0843	53	0.0001	118	0.0004	123	0.0104	168
86	iit-002	0.0000	165	0.0021	141	-	234	0.0009	184	0.0005	164	0.0443	202
87	imagus-000	0.0002	196	0.0028	150	0.1107	57	0.0010	187	0.0012	195	0.0347	197
88	imagus-001	0.0000	135	0.0030	152	-	234	0.0001	105	0.0004	125	0.0396	200
89	imperial-000	0.0000	45	0.0000	31	-	234	0.0000	29	0.0000	33	0.0000	25
90	imperial-002	0.0000	10	0.0000	9	0.0000	5	0.0000	8	0.0000	9	0.0000	7
91	incode-005	0.0000	41	0.0008	95	-	234	0.0001	99	0.0004	122	0.0007	119
92	incode-006	0.0000	96	0.0005	76	-	234	0.0001	115	0.0004	89	0.0004	86
93	innovativetechnologyltd-001	0.0001	194	0.0050	180	-	234	0.0024	204	0.0025	208	0.0055	157
94	innovativetechnologyltd-002	0.0000	147	0.0046	177	-	234	0.0057	215	0.0005	156	0.0247	189
95	innovatrics-004	0.0000	127	0.0017	130	0.1170	58	0.0000	79	0.0004	126	0.0041	154
96	innovatrics-006	0.0000	113	0.0009	101	0.0350	36	0.0000	72	0.0004	94	0.0003	78
97	intellicloudai-001	0.0000	84	0.0000	57	-	234	0.0000	55	0.0000	61	0.0001	61
98	intellifusion-001	0.0000	97	0.0005	79	0.0949	55	0.0001	95	0.0003	86	0.0005	105
99	intellifusion-002	0.0000	42	0.0000	62	-	234	0.0000	62	0.0000	31	0.0001	60
100	intellivision-001	0.0042	213	0.0296	205	0.5495	93	0.0048	212	0.0042	216	0.1358	215
101	intellivision-002	0.0000	180	0.0046	176	-	234	0.0012	190	0.0005	165	0.0146	174
102	intelresearch-000	0.0000	95	0.0006	80	-	234	0.0000	75	0.0003	85	0.0001	62
103	intelresearch-001	0.0000	171	0.0082	195	-	234	0.0005	164	0.0010	181	0.0407	201
104	intsysmsu-001	0.0000	38	0.0010	105	-	234	0.0001	102	0.0004	119	0.0004	92
105	intsysmsu-002	0.0000	62	0.0010	106	-	234	0.0001	103	0.0004	120	0.0004	94
106	iqface-000	0.0000	65	0.0000	45	0.0000	24	0.0000	43	0.0000	48	0.0000	38
107	iqface-001	0.0000	26	0.0000	19	-	234	0.0000	60	0.0000	19	0.0000	15
108	isap-001	0.0000	60	0.0000	43	-	234	0.0000	40	0.0000	45	0.0000	35
109	isityou-000	0.0068	217	0.0316	209	0.4714	88	0.0023	201	0.0010	184	0.0663	209
110	isystems-001	0.0000	167	0.0035	163	0.1421	61	0.0010	185	0.0007	173	0.0128	171
111	isystems-002	0.0000	168	0.0035	164	0.1421	62	0.0010	186	0.0007	174	0.0128	172
112	itmo-006	0.0000	13	0.0015	128	-	234	0.0004	155	0.0004	117	0.0006	111
113	itmo-007	0.0000	69	0.0009	100	-	234	0.0003	146	0.0000	52	0.0004	88
114	kakao-002	0.0000	148	0.0057	187	0.2494	79	0.0002	133	0.0005	152	0.0310	192
115	kakao-003	0.0000	39	0.0000	28	-	234	0.0000	26	0.0000	29	0.0000	22
116	kedacom-000	0.0000	32	0.0000	24	0.0000	12	0.0000	23	0.0000	25	0.0000	18

Table 18: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.

[1] The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.

	Algorithm	Failure to Enrol Rate[1]											
	Name	APPLICATION		BORDER		CHILD-EXPLOIT		MUGSHOT		VISA		WILD	
	Name	SEC. 2.3		SEC. 2.4		SEC. 2.1		SEC. 2.5		SEC. 2.2		SEC. 2.6	
117	kneron-003	0.0239	221	0.0306	206	0.4883	91	0.0044	211	0.0016	203	0.1823	219
118	kneron-005	0.0000	170	0.0226	201	-	234	0.0006	169	0.0005	153	0.0097	166
119	lookman-002	0.0000	59	0.0000	42	-	234	0.0000	39	0.0000	44	0.0000	34
120	lookman-004	0.0000	50	0.0000	36	0.0000	19	0.0000	34	0.0000	38	0.0000	28
121	luxand-000	0.0000	14	0.0000	11	-	234	0.0000	10	0.0000	11	0.0000	9
122	megvii-001	0.0000	83	0.0006	82	0.0274	35	0.0007	174	0.0004	99	0.0152	177
123	megvii-002	0.0000	81	0.0006	81	0.0274	34	0.0054	214	0.0004	98	0.0126	170
124	meiya-001	0.0000	166	0.0028	151	-	234	0.0004	156	0.0010	185	0.0025	147
125	microfocus-001	0.0001	192	0.0053	185	0.0791	52	0.0008	180	0.0016	202	0.0220	184
126	microfocus-002	0.0001	191	0.0053	184	0.0791	51	0.0008	179	0.0016	201	0.0220	183
127	mt-000	0.0000	105	0.0008	96	0.1043	56	0.0002	130	0.0004	134	0.0004	83
128	mt-002	0.0000	93	0.0003	67	-	234	0.0001	86	0.0004	91	0.0004	91
129	mvision-001	0.0000	52	0.0000	37	-	234	0.0000	35	0.0000	39	0.0000	29
130	nazhiai-000	0.0000	58	0.0000	41	-	234	0.0000	38	0.0000	43	0.0000	33
131	netbridgetech-001	0.0000	8	0.0000	8	-	234	0.0000	7	0.0000	8	0.0000	6
132	neurotechnology-008	0.0000	145	0.0006	83	-	234	0.0004	150	0.0004	104	0.0018	145
133	neurotechnology-009	0.0000	126	0.0008	94	-	234	0.0002	125	0.0004	97	0.0018	144
134	nodeflux-002	0.0000	123	0.0261	203	-	234	0.0008	178	0.0005	157	0.0008	128
135	notiontag-000	0.0000	47	0.0000	33	0.0000	17	0.0000	31	0.0000	35	0.0000	26
136	ntechlab-007	0.0000	140	0.0019	137	0.0682	49	0.0001	90	0.0004	95	0.0005	104
137	ntechlab-008	0.0000	133	0.0005	75	-	234	0.0001	92	0.0004	92	0.0005	100
138	paravision-004	0.0000	149	0.0007	91	0.0570	43	0.0002	127	0.0004	110	0.0008	122
139	pixelall-003	0.0000	70	0.0000	48	-	234	0.0000	47	0.0000	53	0.0000	41
140	pixelall-004	0.0000	5	0.0000	5	-	234	0.0000	4	0.0000	5	0.0000	3
141	psl-003	0.0000	115	0.0007	85	-	234	0.0000	76	0.0004	116	0.0003	76
142	psl-005	0.0000	91	0.0007	84	-	234	0.0000	67	0.0004	105	0.0003	74
143	pxl-001	0.0000	183	0.0044	173	-	234	0.0005	162	0.0022	206	0.0323	195
144	pyramid-000	0.0001	189	0.0041	169	-	234	0.0005	161	0.0007	175	0.0015	142
145	rankone-008	0.0000	177	0.0049	179	-	234	0.0003	137	0.0004	88	0.0040	153
146	rankone-009	0.0000	85	0.0000	58	-	234	0.0000	56	0.0000	62	0.0000	52
147	realnetworks-002	0.0000	146	0.0003	70	-	234	0.0004	148	0.0003	76	0.0004	93
148	realnetworks-003	0.0000	143	0.0003	69	0.0076	31	0.0004	147	0.0003	75	0.0004	96
149	remarkai-001	0.0000	49	0.0000	35	-	234	0.0000	33	0.0000	37	0.0000	55
150	remarkai-002	0.0000	29	0.0000	21	-	234	0.0000	20	0.0000	22	0.0000	53
151	rokid-000	0.0000	78	0.0072	192	-	234	0.0001	101	0.0005	154	0.0354	198
152	rokid-001	0.0000	27	0.0013	123	-	234	0.0000	18	0.0000	20	0.0007	120
153	s1-001	0.0000	182	0.0073	193	-	234	0.0013	192	0.0007	171	0.0600	208
154	saffe-001	0.0000	43	0.0000	30	0.0000	16	0.0000	28	0.0000	32	0.0000	24
155	saffe-002	0.0000	74	0.0000	52	-	234	0.0000	51	0.0000	57	0.0000	43
156	samtech-001	0.0001	188	0.0032	157	-	234	0.0004	154	0.0008	177	0.0013	139
157	scanovate-001	0.0208	220	0.2388	218	-	234	0.0024	202	0.0014	198	0.2751	220
158	scanovate-002	0.0000	141	0.0018	133	-	234	0.0000	83	0.0004	145	0.0008	124
159	sensetime-002	0.0004	206	0.0082	194	0.3345	84	0.0011	189	0.0005	163	0.0218	182
160	sensetime-003	0.0000	116	0.0011	114	0.0554	41	0.0000	63	0.0004	112	0.0004	98
161	sertis-000	0.0000	12	0.0007	87	-	234	0.0000	84	0.0004	103	0.0004	85
162	shaman-000	0.0000	54	0.0000	39	0.0000	22	0.0000	37	0.0000	41	0.0000	31
163	shaman-001	0.0000	2	0.0000	2	0.0000	1	0.0000	2	0.0000	2	0.0000	50
164	shu-002	0.0000	125	0.0010	107	-	234	0.0005	157	0.0004	136	0.0007	116
165	shu-003	0.0000	55	0.0007	86	-	234	0.0001	87	0.0003	77	0.0004	99
166	siat-002	0.0000	119	0.0012	121	0.0616	45	0.0000	73	0.0004	113	0.0048	156
167	siat-004	0.0000	106	0.0011	113	-	234	0.0000	71	0.0004	109	0.0003	75
168	sjtu-001	0.0000	128	0.0010	109	-	234	0.0005	159	0.0004	143	0.0008	126
169	sjtu-002	0.0000	138	0.0010	108	-	234	0.0005	158	0.0004	139	0.0007	118
170	smilart-002	0.0000	172	0.0036	165	0.2422	76	0.0003	145	0.0011	189	0.0575	206
171	smilart-003	0.0003	201	0.0100	197	-	234	0.0014	196	0.0013	197	0.0555	204
172	staqu-000	0.0000	63	0.0000	44	-	234	0.0000	42	0.0000	47	0.0000	37
173	starhybrid-001	0.0001	193	0.0033	161	0.2340	75	0.0009	183	0.0023	207	0.0044	155
174	synesis-006	0.0000	35	0.0003	71	-	234	0.0000	77	0.0003	72	0.0002	69

Table 19: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.

[1] *The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]											
	Name	APPLICATION		BORDER		CHILD-EXPLOIT		MUGSHOT		VISA		WILD	
	Name	SEC. 2.3		SEC. 2.4		SEC. 2.1		SEC. 2.5		SEC. 2.2		SEC. 2.6	
175	synesis-007	0.0000	122	0.0013	122	-	234	0.0002	134	0.0004	114	0.0005	101
176	synology-000	0.0000	19	0.0000	14	-	234	0.0000	13	0.0000	14	0.0000	12
177	synology-001	0.0000	71	0.0000	49	-	234	0.0000	48	0.0000	54	0.0000	42
178	tech5-003	0.0000	136	0.0005	77	0.0016	30	0.0001	96	0.0003	73	0.0002	64
179	tech5-004	0.0000	118	0.0008	93	-	234	0.0003	140	0.0004	142	0.0006	108
180	tevian-004	0.0000	151	0.0024	144	-	234	0.0002	124	0.0005	160	0.0057	158
181	tevian-005	0.0001	195	0.0041	168	0.3606	85	0.0006	170	0.0006	170	0.0012	137
182	tiger-002	0.0000	111	0.0010	104	0.0619	47	0.0001	108	0.0004	108	0.0082	163
183	tiger-003	0.0000	94	-	234	0.0619	46	0.0001	106	0.0004	107	0.0082	162
184	tongyi-005	0.0000	7	0.0000	7	0.0000	4	0.0000	6	0.0000	7	0.0000	5
185	toshiba-002	0.0000	20	0.0000	15	0.0000	8	0.0000	14	0.0000	15	0.0000	13
186	toshiba-003	0.0000	79	0.0001	65	-	234	0.0001	109	0.0001	67	0.0002	68
187	trueface-000	0.0000	120	0.0000	54	-	234	0.0000	53	0.0000	59	0.0000	45
188	trueface-001	0.0000	129	0.0038	167	-	234	0.0007	175	0.0005	155	0.0277	190
189	tuputech-000	0.0003	204	0.0116	200	-	234	0.0632	221	0.0081	219	0.6383	222
190	ulsee-001	0.0000	72	0.0000	50	-	234	0.0000	49	0.0000	55	0.0001	56
191	uluface-002	0.0000	48	0.0000	34	0.0000	18	0.0000	32	0.0000	36	0.0000	27
192	uluface-003	0.0000	18	0.0001	66	-	234	0.0002	121	0.0002	69	0.0244	188
193	umd-03c	-	234	-	234	-	234	0.0000	70	-	234	-	234
194	upc-001	0.0000	161	0.0003	68	0.0450	38	0.0003	138	0.0003	83	0.0011	135
195	vd-001	0.0000	169	0.0030	153	-	234	0.0004	153	0.0009	178	0.0024	146
196	veridas-003	0.0000	158	0.0026	146	0.1893	67	0.0001	107	0.0005	150	0.0006	109
197	veridas-004	0.0000	160	0.0026	147	-	234	0.0001	110	0.0005	151	0.0006	110
198	via-000	0.0000	67	0.0000	46	0.0000	25	0.0000	45	0.0000	50	0.0001	58
199	via-001	0.0000	24	0.0000	17	-	234	0.0000	16	0.0000	17	0.0001	57
200	videmo-000	0.0000	139	0.0019	138	-	234	0.0003	142	0.0012	196	0.0158	178
201	videonetics-001	0.0004	205	0.0309	207	0.4799	89	0.0015	198	0.0010	183	0.0112	169
202	videonetics-002	0.0000	142	0.0459	213	0.4598	87	0.0006	171	0.0005	162	0.0013	138
203	vigilantsolutions-006	0.0000	155	0.0028	149	-	234	0.0001	94	0.0004	96	0.0005	103
204	vigilantsolutions-007	0.0000	152	0.0028	148	0.2538	80	0.0001	93	0.0004	93	0.0005	102
205	vion-000	0.0050	214	0.0392	212	0.6388	95	0.0130	218	0.0078	218	0.1389	216
206	visionbox-000	0.0000	176	0.0033	160	-	234	0.0005	168	0.0011	191	0.0028	150
207	visionbox-001	0.0000	175	0.0033	159	-	234	0.0005	167	0.0011	190	0.0028	149
208	visionlabs-007	0.0000	134	0.0014	126	0.1939	69	0.0003	143	0.0005	149	0.0008	127
209	visionlabs-008	0.0000	112	0.0015	127	-	234	0.0002	135	0.0004	146	0.0009	129
210	visteam-000	0.0000	174	0.0031	156	-	234	0.0005	163	0.0011	186	0.0026	148
211	vocord-007	0.0000	130	0.0535	214	0.0000	10	0.0001	117	0.0004	90	0.0009	131
212	vocord-008	0.0000	107	0.0015	129	-	234	0.0003	144	0.0001	66	0.0007	117
213	winsense-000	0.0000	17	0.0000	13	0.0000	7	0.0000	12	0.0000	13	0.0000	11
214	winsense-001	0.0000	40	0.0000	29	0.0000	15	0.0000	27	0.0000	30	0.0000	23
215	x-laboratory-000	0.0247	222	0.0000	55	0.0000	28	0.0005	166	0.0002	70	0.0000	46
216	x-laboratory-001	0.0000	114	0.0012	120	-	234	0.0001	111	0.0004	138	0.0007	113
217	xforwardai-000	0.0000	1	0.0000	1	-	234	0.0000	1	0.0000	1	0.0000	1
218	yisheng-004	0.0002	197	-	234	0.4279	86	0.0013	193	0.0006	168	0.0321	194
219	yitu-003	0.0000	4	0.0000	4	-	234	0.0009	182	0.0000	4	0.0000	2
220	yoonik-000	0.0000	110	0.0019	139	-	234	0.0001	100	0.0004	137	0.0009	132
221	yuan-000	0.0000	68	0.0000	47	-	234	0.0000	46	0.0000	51	0.0000	40

Table 20: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.

[1] The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.4 Recognition accuracy

Core algorithm accuracy is stated via:

- ▷ **Cooperative subjects**
  - The summary table of Figure 16;
  - The visa image DETs of Figure 35;
  - The mugshot DETs of Figure 46;
  - The mugshot ageing profiles of Figure 173;
  - The human-difficult pairs of Figure 13
- ▷ **Non-cooperative subjects**
  - The photojournalism DET of Figure 56
  - The child-exploitation DET of Figure 60;
  - The child-exploitation CMC of Figure 64.

Figure 140 shows dependence of false match rate on algorithm score threshold. This allows a deployer to set a threshold to target a particular false match rate appropriate to the security objectives of the application.

Figure 117 likewise shows FMR(T) but for mugshots, and specially four subsets of the population.

Note that in both the mugshot and visa sets false match rates vary with the ethnicity, age, and sex, of the enrollee and impostor - see section 3.6. For example figure 76 summarizes FMR for impostors paired from four groups black females, black males, white females, white males.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 4: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 5: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 6: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 7: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 8: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 9: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 10: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 11: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 12: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 13: The Figure shows, in blue, algorithms that correctly separate the 12 genuine and 8 impostor pairs used in the May 2018 paper Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms *(Phillips et al. [1]). In red are algorithms that are imperfect. Some algorithms fail only because they failed to make a template e.g. due to face detection failure (shown as a triangle). Others fail because the pairs were selected for that study because they had been difficult for three leading algorithms used in FRVT 2006. Caution: Given the small sample size (n=20) the figure may change substantially if larger or different sets were used. The images can be downloaded from the* Supplemental Information *page provided with that publication.*

Figure 14: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 15: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 16: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 17: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 18: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 19: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 20: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 21: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

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Figure 25: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 26: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 27: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 28: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

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Figure 30: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 31: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 32: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 33: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 34: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 35: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

Figure 36: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

Figure 37: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

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Figure 43: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

Figure 44: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

Figure 45: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

Figure 46: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

Figure 47: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 48: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 49: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 50: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 51: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 52: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 53: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 54: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 55: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 56: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

Figure 57: For child exploitation images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR. Accuracy is poor because many images have adverse quality characteristics, and because detection and enrollment fails.

Figure 58: For child exploitation images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR. Accuracy is poor because many images have adverse quality characteristics, and because detection and enrollment fails.

Figure 59: For child exploitation images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR. Accuracy is poor because many images have adverse quality characteristics, and because detection and enrollment fails.

Figure 60: For child exploitation images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR. Accuracy is poor because many images have adverse quality characteristics, and because detection and enrollment fails.

Figure 61: For child exploitation images, cumulative match characteristics (CMC) showing true positive identification rate vs. rank. This is simulation of a one-to-many search experiment - see discussion in section 3.2. The scales are logarithmic in order to show the effect of long candidate lists. Accuracy is poor but much improved relative to the 1:1 DETs of Fig. 60 because a search can succeed if any of a subject's several enrolled images matches the search image with a high score.

Figure 62: For child exploitation images, cumulative match characteristics (CMC) showing true positive identification rate vs. rank. This is simulation of a one-to-many search experiment - see discussion in section 3.2. The scales are logarithmic in order to show the effect of long candidate lists. Accuracy is poor but much improved relative to the 1:1 DETs of Fig. 60 because a search can succeed if any of a subject's several enrolled images matches the search image with a high score.

Figure 63: For child exploitation images, cumulative match characteristics (CMC) showing true positive identification rate vs. rank. This is simulation of a one-to-many search experiment - see discussion in section 3.2. The scales are logarithmic in order to show the effect of long candidate lists. Accuracy is poor but much improved relative to the 1:1 DETs of Fig. 60 because a search can succeed if any of a subject's several enrolled images matches the search image with a high score.

Figure 64: For child exploitation images, cumulative match characteristics (CMC) showing true positive identification rate vs. rank. This is simulation of a one-to-many search experiment - see discussion in section 3.2. The scales are logarithmic in order to show the effect of long candidate lists. Accuracy is poor but much improved relative to the 1:1 DETs of Fig. 60 because a search can succeed if any of a subject's several enrolled images matches the search image with a high score.

Figure 65: For child exploitation images, cumulative match characteristics (CMC) showing true positive identification rate vs. rank for two cases: 1. Whole image provided to the algorithm; 2. Human annotated rectangular region, cropped and provided to the algorithm. The difference between the traces is associated with detection of difficult faces, and fine localization.

Figure 66: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 67: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 68: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 69: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 70: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 71: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 72: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 73: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 74: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 75: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 76: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographc that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

Figure 77: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 78: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 79: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 80: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 81: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 82: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 83: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 84: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 85: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 86: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 87: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 117. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

Figure 88: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between $(FMR,FNMR)_{MALE}$ and $(FMR,FNMR)_{FEMALE}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 89: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between $(FMR,FNMR)_{MALE}$ and $(FMR,FNMR)_{FEMALE}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 90: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 91: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 92: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between $(FMR,FNMR)_{MALE}$ and $(FMR,FNMR)_{FEMALE}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 93: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 94: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 95: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 96: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 97: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 98: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between $(FMR,FNMR)_{MALE}$ and $(FMR,FNMR)_{FEMALE}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 99: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 100: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 101: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 102: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 103: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 104: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 105: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 106: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

Figure 107: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 108: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 109: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 110: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 111: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 112: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 113: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 114: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 115: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 116: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 117: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

Figure 118: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 119: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 120: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 121: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 122: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 123: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 124: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 125: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 126: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 127: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 128: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 129: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 130: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 131: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 132: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 133: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 134: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 135: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 136: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 137: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 138: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 139: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

Figure 140: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

3.5 Genuine distribution stability

3.5.1 Effect of birth place on the genuine distribution

Background: Both skin tone and bone structure vary geographically. Prior studies have reported variations in FNMR and FMR.

Goal: To measure false non-match rate (FNMR) variation with country of birth.

Methods: Thresholds are determined that give FMR = $\{0.001, 0.0001\}$ over the entire impostor set. Then FNMR is measured over 1000 bootstrap replications of the genuine scores. Only those countries with at least 140 individuals are included in the analysis.

Results: Figure 159 shows FNMR by country of birth for the two thresholds.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 141: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 142: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 143: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 144: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 145: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 146: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 147: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 148: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 149: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 150: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 151: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 152: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 153: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 154: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 155: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 156: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 157: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 158: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 159: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Caveats: The results may not relate to subject-specific properties. Instead they could reflect image-specific quality differences, which could occur due to collection protocol or software processing variations.

3.5.2 Effect of ageing

Background: Faces change appearance throughout life. This change gradually reduces similarity of a new image to an earlier image. Face recognition algorithms give reduced similarity scores and more frequent false rejections.

Goal: To quantify false non-match rates (FNMR) as a function of elapsed time in an adult population.

Methods: Using the mugshot images, a threshold is set to give FMR = 0.00001 over the entire impostor set. Then FNMR is measured over 1000 bootstrap replications of the genuine scores.

Results: For the visa images, Figure 173 shows how false non-match rates for genuine users, as a function of age group.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 160: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 161: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 162: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 163: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 164: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 165: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 166: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 167: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 168: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 169: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 170: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 171: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 172: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{1}0^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

Figure 173: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

3.5.3 Effect of age on genuine subjects

Background: Faces change appearance throughout life. Face recognition algorithms have previously beeen reported to give better accuracy on older individuals (See NIST IR 8009).

Goal: To quantify false non-match rates (FNMR) as a function of age, without an ageing component.

Methods: Using the visa images, which span fewer than five years, thresholds are determined that give FMR = 0.001 and 0.0001 over the entire impostor set. Then FNMR is measured over 1000 bootstrap replications of the genuine scores.

Results: For the visa images, Figure 192 shows how false non-match rates for genuine users, as a function of age group.

The notable aspects are:

- ▷ Younger subjects give considerably higher FNMR. This is likely due to rapid growth and change in facial appearance.
- ▷ FNMR trends down throughout life. The last bin, AGE $>$ 72, contains fewer than 140 mated pairs, and may be affected by small sample size.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 174: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 175: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 176: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 177: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 178: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 179: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 180: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 181: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 182: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 183: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 184: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 185: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 186: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 187: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 188: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 189: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 190: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 191: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 192: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Caveats: None.

3.6 Impostor distribution stability

3.6.1 Effect of birth place on the impostor distribution

Background: Facial appearance varies geographically, both in terms of skin tone, cranio-facial structure and size. This section addresses whether false match rates vary intra- and inter-regionally.

Goals:

- ▷ To show the effect of birth region of the impostor and enrollee on false match rates.
- ▷ To determine whether some algorithms give better impostor distribution stability.

Methods:

- ▷ For the visa images, NIST defined 10 regions: Sub-Saharan Africa, South Asia, Polynesia, North Africa, Middle East, Europe, East Asia, Central and South America, Central Asia, and the Caribbean.
- ▷ For the visa images, NIST mapped each country of birth to a region. There is some arbitrariness to this. For example, Egypt could reasonably be assigned to the Middle East instead of North Africa. An alternative methodology could, for example, assign the Philippines to *both* Polynesia and East Asia.
- ▷ FMR is computed for cases where all face images of impostors born in region r_2 are compared with enrolled face images of persons born in region r_1.

$$\text{FMR}(r_1, r_2, T) = \frac{\sum_{i=1}^{N_{r_1,r_2}} H(s_i - T)}{N_{r_1,r_2}} \tag{5}$$

  where the same threshold, T, is used in all cells, and H is the unit step function. The threshold is set to give FMR(T) = 0.001 over the entire set of visa image impostor comparisons.
- ▷ This analysis is then repeated by country-pair, but only for those country pairs where both have at least 1000 images available. The countries[1] appear in the axes of graphs that follow.
- ▷ The mean number of impostor scores in any cross-region bin is 33 million. The smallest number of impostor scores in any bin is 135000, for Central Asia - North Africa. While these counts are large enough to support reasonable significance, the number of individual faces is much smaller, on the order of $N^{0.5}$.
- ▷ The numbers of impostor scores in any cross-country bin is shown in Figure 625.

Results: Subsequent figures show heatmaps that use color to represent the base-10 logarithm of the false match rate. Red colors indicate high (bad) false match rates. Dark colors indicate benign false match rates. There are two series of graphs corresponding to aggregated geographical regions, and to countries. The notable observations are:

- ▷ The on-diagonal elements correspond to within-region impostors. FMR is generally above the nominal value of FMR = 0.001. Particularly there is usually higher FMR in, Sub-Saharan Africa, South Asia, and the Caribbean. Europe and Central Asia, on the other hand, usually give FMR closer to the nominal value.
- ▷ The off-diagonal elements correspond to across-region impostors. The highest FMR is produced between the Caribbean and Sub-Saharan Africa.
- ▷ Algorithms vary.

[1] These are Argentina, Australia, Brazil, Chile, China, Costa Rica, Cuba, Czech Republic, Dominican Republic, Ecuador, Egypt, El Salvador, Germany, Ghana, Great Britain, Greece, Guatamala, Haiti, Hong Kong, Honduras, Indonesia, India, Israel, Jamaica, Japan, Kenya, Korea, Lebanon, Mexico, Malaysia, Nepal, Nigeria, Peru, Philippines, Pakistan, Poland, Romania, Russia, South Africa, Saudi Arabia, Thailand, Trinidad, Turkey, Taiwan, Ukraine, Venezuela, and Vietnam.

Figure 193: For the visa images, the dots show FMR for impostor comparisons of individuals of the same sex and same age group for the region of the world that gives the worst (highest) FMR when the threshold is set to give FMR = 0.001 (red vertical line) over all on the order of 10^{10} impostor scores i.e. zero-effort. The shift of the dots to right shows massive increases in FMR when impostors have the same sex, age, and region of birth. The color code indicates which region gives the worst case FMR. If the observed variation is due to the prevalence of one kind of images in the training imagery, then algorithms developed on one kind of data might be expected to give higher FMR on other kinds.

- We computed the same quantities for a global FMR = 0.0001. The effects are similar.

Caveats:

- The effects of variable impostor rates on one-to-many identification systems may well differ from what's implied by these one-to-one verification results. Two reasons for this are a) the enrollment galleries are usually imbalanced across countries of birth, age and sex; b) one-to-many identification algorithms often implement techniques aimed at stabilizing the impostor distribution. Further research is necessary.
- In principle, the effects seen in this subsection could be due to differences in the image capture process. We consider this unlikely since the effects are maintained across geography - e.g. Caribbean vs. Africa, or Japan vs. China.

Figure 194: For visa images, the heatmap shows how the mean of the impostor distribution for the country pair (a,b) is shifted relative to the mean of the global impostor distribution, expressed as a number of standard deviations of the global impostor distribution. This statistic is designed to show shifts in the entire impostor distribution, not just tail effects that manifest as the anomalously high (or low) false match rates that appear in the subsequent figures. The countries are chosen to show that skin tone alone does not explain impostor distribution shifts. The reduced shift in Asian populations with the Yitu and TongYiTrans algorithms, is accompanied by positive shifts in the European populations. This reversal relative to most other algorithms, may derive from use of nationally weighted training sets. The figure is computed from same-sex and same-age impostor pairs.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 195: For algorithm 3divi-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 196: For algorithm 3divi-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 197: For algorithm acer-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 198: For algorithm acer-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 199: For algorithm adera-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 200: For algorithm advance-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 201: For algorithm aifirst-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 202: For algorithm ailabs-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 203: For algorithm aimall-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 204: For algorithm aimall-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 205: For algorithm aiunionface-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 206: For algorithm alchera-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 207: For algorithm alchera-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 208: For algorithm alleyes-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 209: For algorithm allgovision-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 210: For algorithm alphaface-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 211: For algorithm alphaface-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 212: For algorithm amplifiedgroup-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 213: For algorithm androvideo-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 214: For algorithm anke-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 215: For algorithm anke-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 216: For algorithm antheus-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 217: For algorithm antheus-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 218: For algorithm anyvision-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 219: For algorithm anyvision-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 220: For algorithm asusaics-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 221: For algorithm asusaics-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 222: For algorithm aware-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 223: For algorithm aware-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 224: For algorithm awiros-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 225: For algorithm ayftech-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 226: For algorithm ayonix-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 227: For algorithm bioidtechswiss-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 228: For algorithm bm-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 229: For algorithm camvi-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 230: For algorithm camvi-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 231: For algorithm ceiec-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 232: For algorithm ceiec-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 233: For algorithm chosun-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 234: For algorithm chosun-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 235: For algorithm chtface-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 236: For algorithm chtface-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 237: For algorithm cib-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 238: For algorithm cogent-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 239: For algorithm cogent-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 240: For algorithm cognitec-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 241: For algorithm cognitec-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 242: For algorithm ctbcbank-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 243: For algorithm ctbcbank-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 244: For algorithm cuhkee-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 245: For algorithm cyberextruder-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 246: For algorithm cyberextruder-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 247: For algorithm cyberlink-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 248: For algorithm cyberlink-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 249: For algorithm dahua-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 250: For algorithm dahua-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 251: For algorithm deepglint-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 252: For algorithm deepglint-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 253: For algorithm deepsea-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 254: For algorithm dermalog-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 255: For algorithm dermalog-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 256: For algorithm didiglobalface-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 257: For algorithm digitalbarriers-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 258: For algorithm dsk-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 259: For algorithm einetworks-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 260: For algorithm ercacat-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 261: For algorithm expasoft-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 262: For algorithm f8-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 263: For algorithm facesoft-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 264: For algorithm fujitsulab-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 265: For algorithm geo-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 266: For algorithm glory-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 267: For algorithm glory-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 268: For algorithm gorilla-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 269: For algorithm hik-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 270: For algorithm hr-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 271: For algorithm hr-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 272: For algorithm icm-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 273: For algorithm id3-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 274: For algorithm id3-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 275: For algorithm idemia-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 276: For algorithm idemia-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 277: For algorithm iit-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 278: For algorithm iit-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 279: For algorithm imagus-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 280: For algorithm imagus-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 281: For algorithm imperial-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 282: For algorithm imperial-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 283: For algorithm incode-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 284: For algorithm incode-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 285: For algorithm innovativetechnologyltd-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 286: For algorithm innovativetechnologyltd-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 287: For algorithm innovatrics-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 288: For algorithm innovatrics-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 289: For algorithm intellicloudai-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 290: For algorithm intellifusion-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 291: For algorithm intellifusion-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 292: For algorithm intellivision-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 293: For algorithm intellivision-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 294: For algorithm intelresearch-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 295: For algorithm intelresearch-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 296: For algorithm intsysmsu-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 297: For algorithm intsysmsu-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 298: For algorithm iqface-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 299: For algorithm iqface-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 300: For algorithm isap-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 301: For algorithm isityou-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 302: For algorithm isystems-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 303: For algorithm isystems-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 304: For algorithm itmo-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 305: For algorithm itmo-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 306: For algorithm kakao-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 307: For algorithm kakao-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 308: For algorithm kedacom-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 309: For algorithm kneron-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 310: For algorithm kneron-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 311: For algorithm lookman-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 312: For algorithm lookman-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 313: For algorithm luxand-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 314: For algorithm megvii-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 315: For algorithm megvii-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 316: For algorithm meiya-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 317: For algorithm microfocus-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 318: For algorithm microfocus-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 319: For algorithm mt-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 320: For algorithm mt-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 321: For algorithm mvision-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 322: For algorithm nazhiai-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 323: For algorithm netbridgetech-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 324: For algorithm neurotechnology-008 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 325: For algorithm neurotechnology-009 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 326: For algorithm nodeflux-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 327: For algorithm notiontag-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 328: For algorithm ntechlab-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 329: For algorithm ntechlab-008 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 330: For algorithm paravision-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 331: For algorithm pixelall-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 332: For algorithm pixelall-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 333: For algorithm psl-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 334: For algorithm psl-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 335: For algorithm pxl-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 336: For algorithm pyramid-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 337: For algorithm rankone-008 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 338: For algorithm rankone-009 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 339: For algorithm realnetworks-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 340: For algorithm realnetworks-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 341: For algorithm remarkai-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 342: For algorithm remarkai-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 343: For algorithm rokid-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 344: For algorithm rokid-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 345: For algorithm s1-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 346: For algorithm saffe-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 347: For algorithm saffe-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 348: For algorithm samtech-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 349: For algorithm scanovate-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 350: For algorithm scanovate-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 351: For algorithm sensetime-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 352: For algorithm sensetime-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 353: For algorithm sertis-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 354: For algorithm shaman-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 355: For algorithm shaman-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 356: For algorithm shu-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 357: For algorithm shu-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 358: For algorithm siat-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 359: For algorithm siat-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 360: For algorithm sjtu-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 361: For algorithm sjtu-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 362: For algorithm smilart-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 363: For algorithm smilart-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 364: For algorithm staqu-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 365: For algorithm starhybrid-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 366: For algorithm synesis-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 367: For algorithm synesis-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 368: For algorithm synology-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 369: For algorithm synology-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 370: For algorithm tech5-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 371: For algorithm tech5-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 372: For algorithm tevian-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 373: For algorithm tevian-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 374: For algorithm tiger-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 375: For algorithm tiger-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 376: For algorithm tongyi-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 377: For algorithm toshiba-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 378: For algorithm toshiba-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 379: For algorithm trueface-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 380: For algorithm trueface-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 381: For algorithm tuputech-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 382: For algorithm ulsee-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 383: For algorithm uluface-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 384: For algorithm uluface-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 385: For algorithm upc-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 386: For algorithm vcog-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 387: For algorithm vd-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 388: For algorithm veridas-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 389: For algorithm veridas-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 390: For algorithm via-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 391: For algorithm via-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 392: For algorithm videmo-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 393: For algorithm videonetics-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 394: For algorithm videonetics-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 395: For algorithm vigilantsolutions-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 396: For algorithm vigilantsolutions-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 397: For algorithm vion-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 398: For algorithm visionbox-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 399: For algorithm visionbox-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 400: For algorithm visionlabs-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 401: For algorithm visionlabs-008 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 402: For algorithm visteam-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 403: For algorithm vocord-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 404: For algorithm vocord-008 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 405: For algorithm winsense-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 406: For algorithm winsense-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 407: For algorithm x-laboratory-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 408: For algorithm x-laboratory-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 409: For algorithm xforwardai-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 410: For algorithm yisheng-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 411: For algorithm yitu-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 412: For algorithm yoonik-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 413: For algorithm yuan-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given region pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 414: For algorithm 3divi-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 415: For algorithm 3divi-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 416: For algorithm acer-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 417: For algorithm acer-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 418: For algorithm adera-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 419: For algorithm advance-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 420: For algorithm aifirst-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 421: For algorithm ailabs-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 422: For algorithm aimall-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 423: For algorithm aimall-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 424: For algorithm aiunionface-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 425: For algorithm alchera-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 426: For algorithm alchera-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 427: For algorithm alleyes-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 428: For algorithm allgovision-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 429: For algorithm alphaface-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 430: For algorithm alphaface-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 431: For algorithm amplifiedgroup-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 432: For algorithm androvideo-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 433: For algorithm anke-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 434: For algorithm anke-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 435: For algorithm antheus-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 436: For algorithm antheus-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 437: For algorithm anyvision-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 438: For algorithm anyvision-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 439: For algorithm asusaics-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 440: For algorithm asusaics-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 441: For algorithm aware-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 442: For algorithm aware-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 443: For algorithm awiros-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 444: For algorithm ayftech-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 445: For algorithm ayonix-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 446: For algorithm bioidtechswiss-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 447: For algorithm bm-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 448: For algorithm camvi-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 449: For algorithm camvi-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 450: For algorithm ceiec-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 451: For algorithm ceiec-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 452: For algorithm chosun-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 453: For algorithm chosun-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 454: For algorithm chtface-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 455: For algorithm chtface-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 456: For algorithm cib-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 457: For algorithm cogent-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 458: For algorithm cogent-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 459: For algorithm cognitec-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 460: For algorithm cognitec-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 461: For algorithm ctbcbank-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 462: For algorithm ctbcbank-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 463: For algorithm cyberextruder-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 464: For algorithm cyberextruder-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 465: For algorithm cyberlink-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 466: For algorithm cyberlink-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 467: For algorithm dahua-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 468: For algorithm dahua-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 469: For algorithm deepglint-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 470: For algorithm deepglint-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 471: For algorithm deepsea-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 472: For algorithm dermalog-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 473: For algorithm dermalog-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 474: For algorithm didiglobalface-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 475: For algorithm digitalbarriers-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 476: For algorithm dsk-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 477: For algorithm einetworks-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 478: For algorithm ercacat-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 479: For algorithm expasoft-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 480: For algorithm f8-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 481: For algorithm facesoft-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 482: For algorithm fujitsulab-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 483: For algorithm geo-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 484: For algorithm glory-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 485: For algorithm glory-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 486: For algorithm gorilla-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 487: For algorithm hik-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 488: For algorithm hr-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 489: For algorithm hr-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 490: For algorithm icm-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 491: For algorithm id3-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 492: For algorithm id3-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 493: For algorithm idemia-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 494: For algorithm idemia-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 495: For algorithm iit-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 496: For algorithm iit-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 497: For algorithm imagus-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 498: For algorithm imagus-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 499: For algorithm imperial-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 500: For algorithm imperial-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 501: For algorithm incode-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 502: For algorithm incode-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 503: For algorithm innovativetechnologyltd-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 504: For algorithm innovatrics-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 505: For algorithm innovatrics-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 506: For algorithm intellicloudai-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 507: For algorithm intellifusion-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 508: For algorithm intellifusion-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 509: For algorithm intellivision-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 510: For algorithm intellivision-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 511: For algorithm intelresearch-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 512: For algorithm intsysmsu-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 513: For algorithm iqface-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 514: For algorithm iqface-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 515: For algorithm isap-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 516: For algorithm isityou-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 517: For algorithm isystems-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 518: For algorithm isystems-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 519: For algorithm itmo-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 520: For algorithm itmo-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 521: For algorithm kakao-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 522: For algorithm kedacom-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 523: For algorithm kneron-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 524: For algorithm kneron-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 525: For algorithm lookman-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 526: For algorithm lookman-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 527: For algorithm luxand-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 528: For algorithm megvii-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 529: For algorithm megvii-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 530: For algorithm meiya-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 531: For algorithm microfocus-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 532: For algorithm microfocus-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 533: For algorithm mt-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 534: For algorithm mt-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 535: For algorithm mvision-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 536: For algorithm nazhiai-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 537: For algorithm netbridgetech-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 538: For algorithm neurotechnology-008 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 539: For algorithm neurotechnology-009 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 540: For algorithm nodeflux-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 541: For algorithm notiontag-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 542: For algorithm ntechlab-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 543: For algorithm paravision-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 544: For algorithm pixelall-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 545: For algorithm pixelall-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 546: For algorithm psl-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 547: For algorithm psl-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 548: For algorithm pxl-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 549: For algorithm pyramid-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 550: For algorithm rankone-008 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 551: For algorithm rankone-009 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 552: For algorithm realnetworks-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 553: For algorithm realnetworks-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 554: For algorithm remarkai-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 555: For algorithm remarkai-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 556: For algorithm rokid-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 557: For algorithm rokid-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 558: For algorithm s1-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 559: For algorithm saffe-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 560: For algorithm saffe-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 561: For algorithm samtech-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 562: For algorithm scanovate-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 563: For algorithm scanovate-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 564: For algorithm sensetime-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 565: For algorithm sensetime-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 566: For algorithm sertis-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 567: For algorithm shaman-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 568: For algorithm shaman-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 569: For algorithm shu-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 570: For algorithm shu-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 571: For algorithm siat-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 572: For algorithm siat-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 573: For algorithm sjtu-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 574: For algorithm sjtu-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 575: For algorithm smilart-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 576: For algorithm smilart-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 577: For algorithm staqu-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 578: For algorithm starhybrid-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 579: For algorithm synesis-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 580: For algorithm synesis-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 581: For algorithm synology-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 582: For algorithm synology-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 583: For algorithm tech5-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 584: For algorithm tech5-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 585: For algorithm tevian-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 586: For algorithm tevian-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 587: For algorithm tiger-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 588: For algorithm tiger-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 589: For algorithm tongyi-005 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 590: For algorithm toshiba-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 591: For algorithm toshiba-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 592: For algorithm trueface-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 593: For algorithm trueface-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 594: For algorithm tuputech-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 595: For algorithm ulsee-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 596: For algorithm uluface-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 597: For algorithm uluface-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 598: For algorithm upc-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 599: For algorithm vcog-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 600: For algorithm vd-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 601: For algorithm veridas-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 602: For algorithm veridas-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 603: For algorithm via-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 604: For algorithm via-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 605: For algorithm videonetics-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 606: For algorithm videonetics-002 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 607: For algorithm vigilantsolutions-006 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 608: For algorithm vigilantsolutions-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 609: For algorithm vion-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 610: For algorithm visionbox-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 611: For algorithm visionbox-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 612: For algorithm visionlabs-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 613: For algorithm visteam-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 614: For algorithm vocord-007 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 615: For algorithm vocord-008 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 616: For algorithm winsense-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 617: For algorithm winsense-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 618: For algorithm x-laboratory-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 619: For algorithm x-laboratory-001 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

Figure 620: For algorithm xforwardai-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 621: For algorithm yisheng-004 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 622: For algorithm yitu-003 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 623: For algorithm yoonik-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 624: For algorithm yuan-000 operating on visa images, the heatmap shows false match rates observed over impostor comparisons of faces from different individuals who were born in the given country pair. False matches are counted against a recognition threshold fixed globally to give the target FMR in the plot title, computed over all on the order of 10^{10} impostor comparisons. If text appears in each box it gives the same quantity as that coded by the color. Grey indicates FMR is at the intended FMR target level. Light red colors present a security vulnerability to, for example, a passport gate. Each +1 increase in log10 FMR corresponds to a factor of 10 increase in FMR. The matrix is not quite symmetric because images in the enrollment and verification sets are different.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 625: For visa images, the heatmap shows the count of impostor comparisons of faces from different individuals who were born in the given country pair.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.6.2 Effect of age on impostors

Background: This section shows the effect of age on the impostor distribution. The ideal behaviour is that the age of the enrollee and the impostor would not affect impostor scores. This would support FMR stability over sub-populations.

Goals:

- ▷ To show the effect of relative ages of the impostor and enrollee on false match rates.
- ▷ To determine whether some algorithms have better impostor distribution stability.

Methods:

- ▷ Define 14 age group bins, spanning 0 to over 100 years old.
- ▷ Compute FMR over all impostor comparisons for which the subjects in the enrollee and impostor images have ages in two bins.
- ▷ Compute FMR over all impostor comparisons for which the subjects are additionally of the same sex, and born in the same geographic region.

Results:

The notable aspects are:

- ▷ Diagonal dominance: Impostors are more likely to be matched against their same age group.
- ▷ Same sex and same region impostors are more successful. On the diagonal, an impostor is more likely to succeed by posing as someone of the same sex. If $\Delta \log_{10} \text{FMR} = 0.2$, then same-sex same-region FMR exceeds the all-pairs FMR by factor of $10^{0.2} = 1.6$.
- ▷ Young children impostors give elevated FMR against young children. Older adult impostor give elevated FMR against older adults. These effects are quite large, for example if $\Delta \log_{10} \text{FMR} = 1.0$ larger than a 32 year old, then these groups have higher FMR by a factor of $10^1 = 10$. This would imply an FMR above 0.01 for a nominal (global) FMR = 0.001.
- ▷ Algorithms vary.
- ▷ We computed the same quantities for a global FMR = 0.0001. The effects are similar.

Note the calculations in this section include impostors paired across all countries of birth.

Figure 626: For algorithm 3divi-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 627: For algorithm 3divi-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 628: For algorithm acer-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 629: For algorithm acer-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 630: For algorithm adera-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 631: For algorithm advance-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 632: For algorithm aifirst-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 633: For algorithm ailabs-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 634: For algorithm aimall-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 635: For algorithm aimall-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 636: For algorithm aiunionface-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 637: For algorithm alchera-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 638: For algorithm alchera-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 639: For algorithm alleyes-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 640: For algorithm allgovision-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 641: For algorithm alphaface-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 642: For algorithm alphaface-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 643: For algorithm amplifiedgroup-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 644: For algorithm androvideo-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 645: For algorithm anke-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 646: For algorithm anke-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 647: For algorithm antheus-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 648: For algorithm antheus-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 649: For algorithm anyvision-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 650: For algorithm anyvision-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 651: For algorithm asusaics-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 652: For algorithm asusaics-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 653: For algorithm aware-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 654: For algorithm aware-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 655: For algorithm awiros-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 656: For algorithm ayftech-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 657: For algorithm ayonix-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 658: For algorithm bioidtechswiss-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 659: For algorithm bm-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 660: For algorithm camvi-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 661: For algorithm camvi-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 662: For algorithm ceiec-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 663: For algorithm ceiec-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 664: For algorithm chosun-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 665: For algorithm chosun-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 666: For algorithm chtface-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 667: For algorithm chtface-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 668: For algorithm cib-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 669: For algorithm cogent-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 670: For algorithm cogent-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 671: For algorithm cognitec-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 672: For algorithm cognitec-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 673: For algorithm ctbcbank-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 674: For algorithm ctbcbank-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 675: For algorithm cuhkee-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 676: For algorithm cyberextruder-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 677: For algorithm cyberextruder-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 678: For algorithm cyberlink-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 679: For algorithm cyberlink-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 680: For algorithm dahua-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 681: For algorithm dahua-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 682: For algorithm deepglint-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 683: For algorithm deepglint-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 684: For algorithm deepsea-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 685: For algorithm dermalog-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 686: For algorithm dermalog-006 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 687: For algorithm didiglobalface-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 688: For algorithm digitalbarriers-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 689: For algorithm dsk-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 690: For algorithm einetworks-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 691: For algorithm ercacat-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 692: For algorithm expasoft-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 693: For algorithm f8-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 694: For algorithm facesoft-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 695: For algorithm fujitsulab-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 696: For algorithm geo-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 697: For algorithm glory-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 698: For algorithm glory-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 699: For algorithm gorilla-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 700: For algorithm hik-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 701: For algorithm hr-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 702: For algorithm hr-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 703: For algorithm icm-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 704: For algorithm id3-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 705: For algorithm id3-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 706: For algorithm idemia-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 707: For algorithm idemia-006 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 708: For algorithm iit-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 709: For algorithm iit-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 710: For algorithm imagus-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 711: For algorithm imagus-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 712: For algorithm imperial-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 713: For algorithm imperial-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 714: For algorithm incode-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 715: For algorithm incode-006 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 716: For algorithm innovativetechnologyltd-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 717: For algorithm innovativetechnologyltd-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 718: For algorithm innovatrics-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 719: For algorithm innovatrics-006 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 720: For algorithm intellicloudai-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 721: For algorithm intellifusion-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 722: For algorithm intellifusion-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 723: For algorithm intellivision-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 724: For algorithm intellivision-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 725: For algorithm intelresearch-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 726: For algorithm intelresearch-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 727: For algorithm intsysmsu-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 728: For algorithm intsysmsu-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 729: For algorithm iqface-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 730: For algorithm iqface-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 731: For algorithm isap-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 732: For algorithm isityou-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 733: For algorithm isystems-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 734: For algorithm isystems-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 735: For algorithm itmo-006 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 736: For algorithm itmo-007 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 737: For algorithm kakao-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 738: For algorithm kakao-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 739: For algorithm kedacom-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 740: For algorithm kneron-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 741: For algorithm kneron-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 742: For algorithm lookman-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 743: For algorithm lookman-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 744: For algorithm luxand-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 745: For algorithm megvii-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 746: For algorithm megvii-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 747: For algorithm meiya-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 748: For algorithm microfocus-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 749: For algorithm microfocus-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 750: For algorithm mt-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 751: For algorithm mt-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 752: For algorithm mvision-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 753: For algorithm nazhiai-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 754: For algorithm netbridgetech-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 755: For algorithm neurotechnology-008 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 756: For algorithm neurotechnology-009 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 757: For algorithm nodeflux-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 758: For algorithm notiontag-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 759: For algorithm ntechlab-007 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 760: For algorithm ntechlab-008 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 761: For algorithm paravision-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 762: For algorithm pixelall-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 763: For algorithm pixelall-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 764: For algorithm psl-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 765: For algorithm psl-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 766: For algorithm pxl-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 767: For algorithm pyramid-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 768: For algorithm rankone-008 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 769: For algorithm rankone-009 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 770: For algorithm realnetworks-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 771: For algorithm realnetworks-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 772: For algorithm remarkai-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 773: For algorithm remarkai-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 774: For algorithm rokid-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 775: For algorithm rokid-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 776: For algorithm s1-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 777: For algorithm saffe-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 778: For algorithm saffe-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 779: For algorithm samtech-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 780: For algorithm scanovate-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 781: For algorithm scanovate-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 782: For algorithm sensetime-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 783: For algorithm sensetime-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 784: For algorithm sertis-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 785: For algorithm shaman-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 786: For algorithm shaman-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 787: For algorithm shu-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 788: For algorithm shu-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 789: For algorithm siat-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 790: For algorithm siat-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 791: For algorithm sjtu-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 792: For algorithm sjtu-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 793: For algorithm smilart-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 794: For algorithm smilart-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 795: For algorithm staqu-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 796: For algorithm starhybrid-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 797: For algorithm synesis-006 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 798: For algorithm synesis-007 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 799: For algorithm synology-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 800: For algorithm synology-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 801: For algorithm tech5-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 802: For algorithm tech5-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 803: For algorithm tevian-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 804: For algorithm tevian-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 805: For algorithm tiger-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 806: For algorithm tiger-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 807: For algorithm tongyi-005 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 808: For algorithm toshiba-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 809: For algorithm toshiba-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 810: For algorithm trueface-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 811: For algorithm trueface-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 812: For algorithm tuputech-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 813: For algorithm ulsee-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 814: For algorithm uluface-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 815: For algorithm uluface-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 816: For algorithm upc-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 817: For algorithm vcog-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 818: For algorithm vd-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 819: For algorithm veridas-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 820: For algorithm veridas-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 821: For algorithm via-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 822: For algorithm via-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 823: For algorithm videmo-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 824: For algorithm videonetics-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 825: For algorithm videonetics-002 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 826: For algorithm vigilantsolutions-006 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 827: For algorithm vigilantsolutions-007 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 828: For algorithm vion-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 829: For algorithm visionbox-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 830: For algorithm visionbox-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 831: For algorithm visionlabs-007 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 832: For algorithm visionlabs-008 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 833: For algorithm visteam-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

Figure 834: For algorithm vocord-007 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 835: For algorithm vocord-008 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 836: For algorithm winsense-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 837: For algorithm winsense-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 838: For algorithm x-laboratory-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 839: For algorithm x-laboratory-001 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 840: For algorithm xforwardai-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

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Figure 841: For algorithm yisheng-004 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 842: For algorithm yitu-003 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 843: For algorithm yoonik-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 844: For algorithm yuan-000 operating on visa images, the heatmap shows false match observed over impostor comparisons of faces from different individuals who have the given age pair. False matches are counted against a recognition threshold fixed globally to give FMR = 0.0001 over all on the order of 10^{10} impostor comparisons. The text in each box gives the same quantity as that coded by the color. Light colors present a security vulnerability to, for example, a passport gate.

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Accuracy Terms + Definitions

In biometrics, Type II errors occur when two samples of one person do not match – this is called a **false negative**. Correspondingly, Type I errors occur when samples from two persons do match – this is called a **false positive**. Matches are declared by a biometric system when the native comparison score from the recognition algorithm meets some **threshold**. Comparison scores can be either **similarity scores**, in which case higher values indicate that the samples are more likely to come from the same person, or **dissimilarity scores**, in which case higher values indicate different people. Similarity scores are traditionally computed by **fingerprint** and **face** recognition algorithms, while dissimilarities are used in **iris recognition**. In some cases, the dissimilarity score is a distance; this applies only when **metric** properties are obeyed. In any case, scores can be either **mate** scores, coming from a comparison of one person's samples, or **nonmate** scores, coming from comparison of different persons' samples. The words **genuine** or **authentic** are synonyms for mate, and the word **impostor** is used a synonym for nonmate. The words mate and nonmate are traditionally used in identification applications (such as law enforcement search, or background checks) while genuine and impostor are used in verification applications (such as access control).

A **error tradeoff** characteristic represents the tradeoff between Type II and Type I classification errors. For verification this plots false non-match rate (FNMR) vs. false match rate (FMR) parametrically with T.

The error tradeoff plots are often called **detection error tradeoff (DET)** characteristics or **receiver operating characteristic** (ROC). These serve the same function but differ, for example, in plotting the complement of an error rate (e.g. TMR = 1 – FNMR) and in transforming the axes most commonly using logarithms, to show multiple decades of FMR. More rarely, the function might be the inverse Gaussian function.

More detail and generality is provided in formal biometrics testing standards, see the various parts of ISO/IEC 19795 Biometrics Testing and Reporting. More terms, including and beyond those to do with accuracy, see ISO/IEC 2382-37 Information technology -- Vocabulary -- Part 37: Harmonized biometric vocabulary

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