A: Datasheet

Algorithm: microsoft_5

Developer: Microsoft

Submission Date: 2018_10_29

Template size: 1024 bytes

Template time (2.5 percentile): 637 msec

Template time (median): 659 msec

Template time (97.5 percentile): 900 msec

Investigation:

Frontal mugshot ranking 29 (out of 279) -- FNIR(1600000, 0, 1) = 0.0019 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 25 (out of 241) -- FNIR(1600000, 0, 1) = 0.0109 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 17 (out of 210) -- FNIR(1600000, 0, 1) = 0.1438 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 19 (out of 168) — FNIR(1600000, 0, 1) = 0.0030 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 29 (out of 165) -- FNIR(1600000, 0, 1) = 0.0987 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

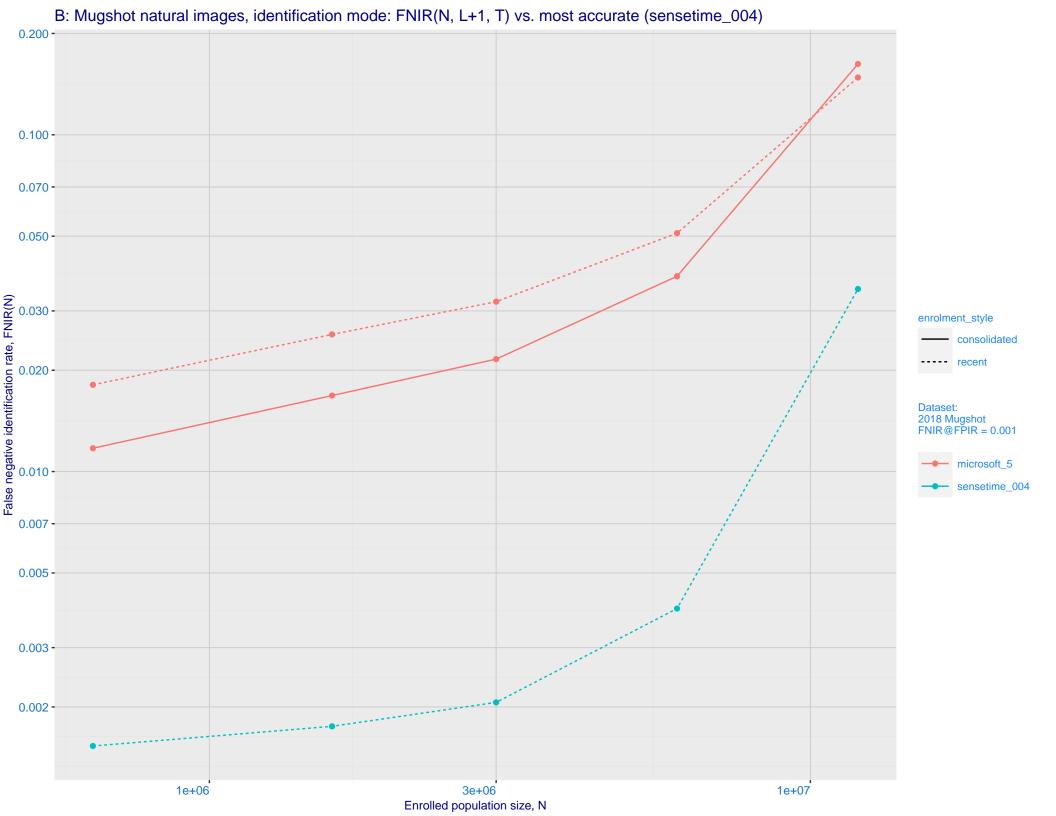
Frontal mugshot ranking 50 (out of 279) -- FNIR(1600000, T, L+1) = 0.0255, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

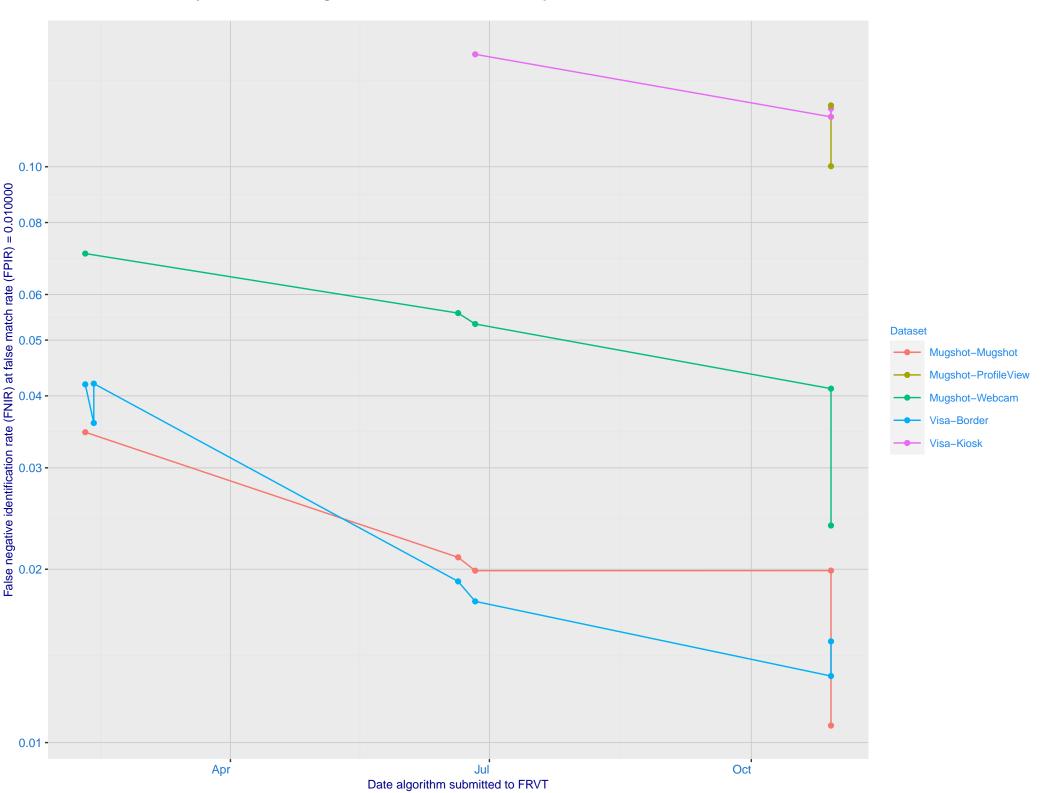
Mugshot webcam ranking 46 (out of 236) -- FNIR(1600000, T, L+1) = 0.0704, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 15 (out of 209) -- FNIR(1600000, T, L+1) = 0.5867, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 27 (out of 167) -- FNIR(1600000, T, L+1) = 0.0268, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 19 (out of 162) — FNIR(1600000, T, L+1) = 0.1809, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

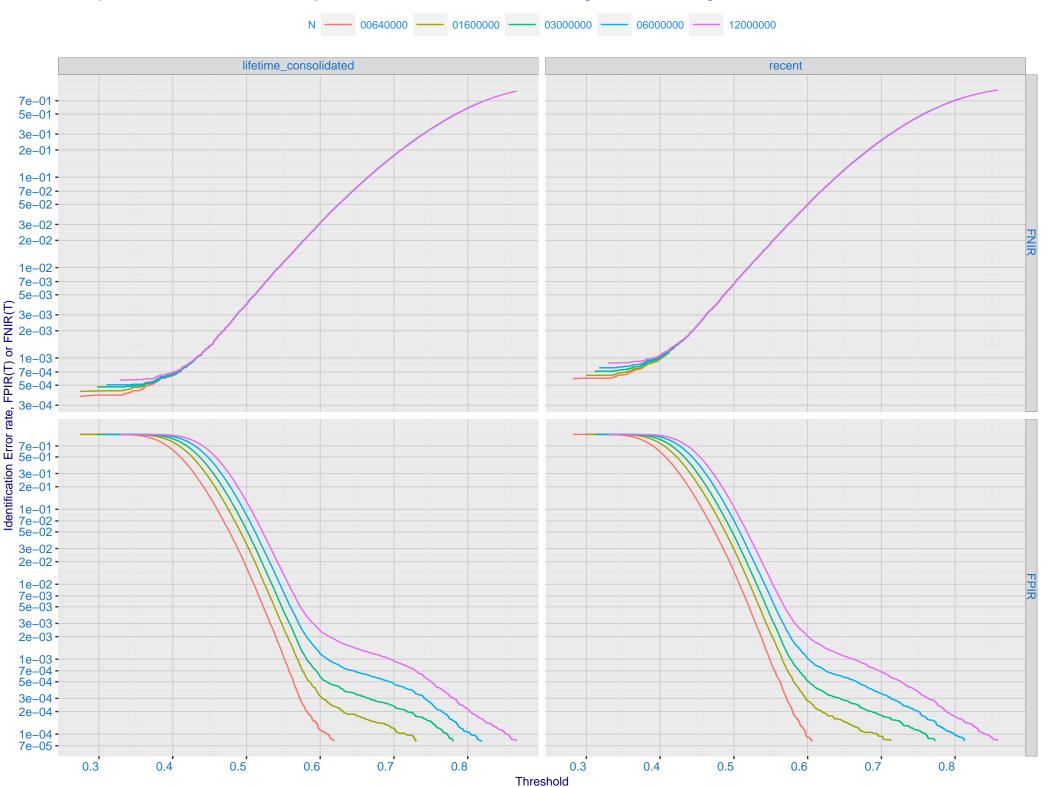




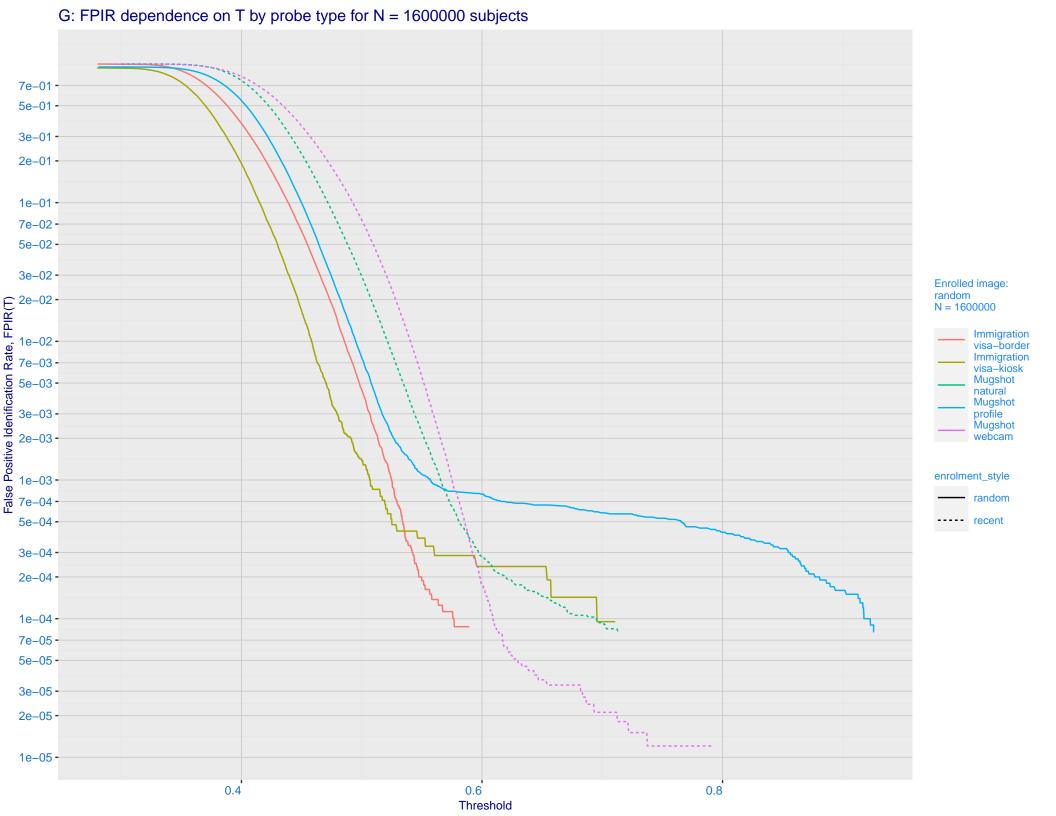
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Ealse negative identification rate, FNIR(T) 0.003 - 0.001 - 0.001 - 0.000 - 0.000 - 0.000 - 0.100 - 0. enrolment_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.070 -0.050 sensetime 004 0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

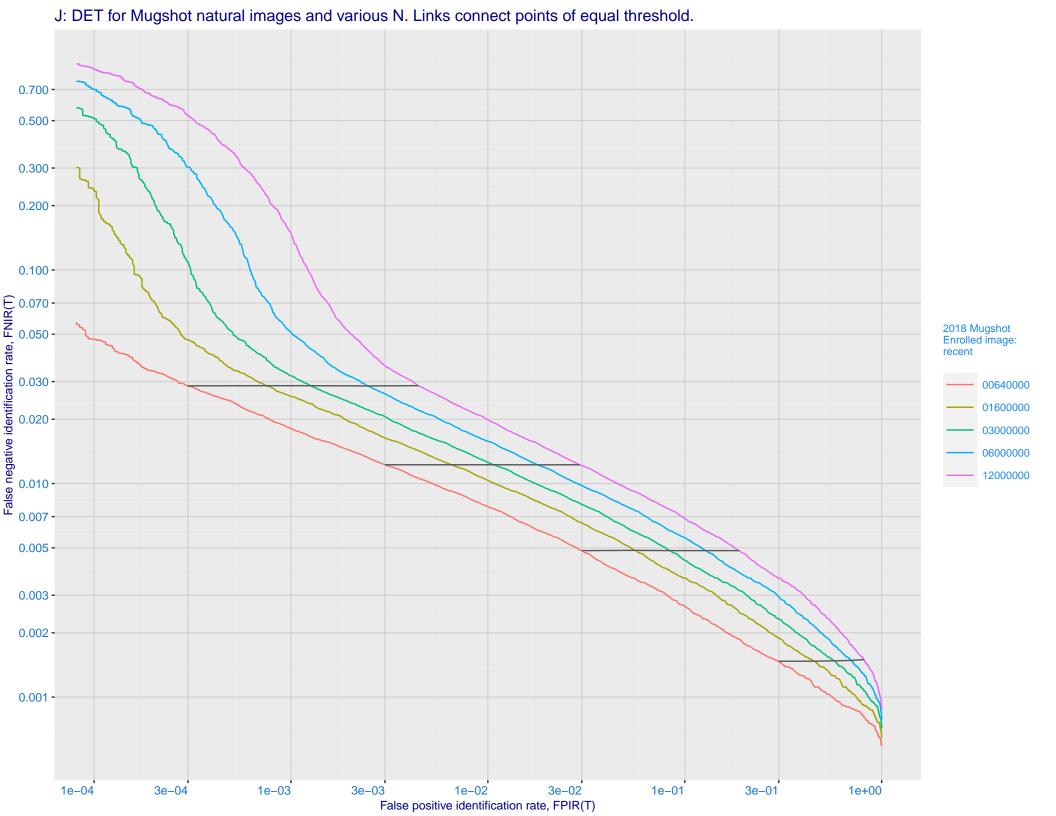
False positive identification rate, FPIR(T)

E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -Selectivity Selectivity 77 | 1e-01 - 75 | 5e-02 - 75 | 5e Enrolled images: recent N = 1600000 Mugshot natural Mugshot webcam 2e-02 -1e-02 -7e-03 -5e-03 -3e-03 -2e-03 -1e-03 -7e-04 -5e-04 -3e-04 -2e-04 -1e-04 -7e-05 -5e-05 -1e-05 3e-05 1e-04 3e-04 1e-03 3e-03 1e-02 3e-02 1e-01 3e-01 False Positive Idenification Rate, FPIR(T)

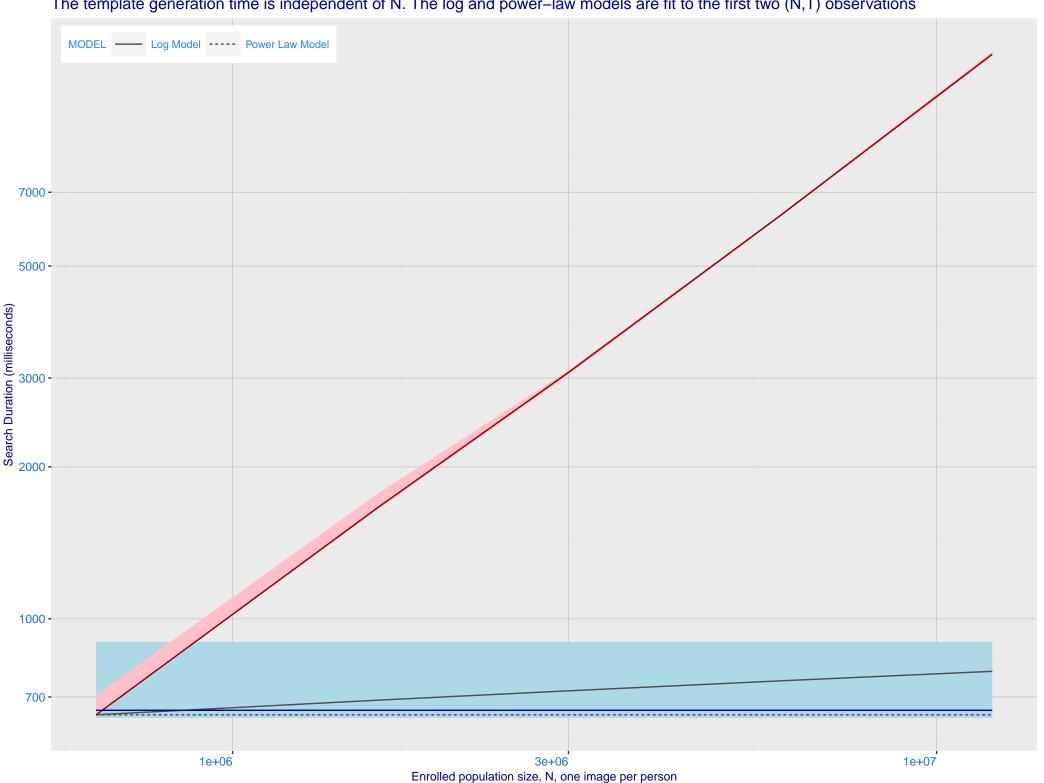




K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.050 - 0.030 - 0. FNIR@Rank = 1 microsoft_5 sensetime_005 Mugshot webcam Mugshot natural enrolment_style consolidated ---- random --- recent 0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -1e+06 3e+06 1e+07 1e+06 3e+06 1e+07 Enrolled population size, N

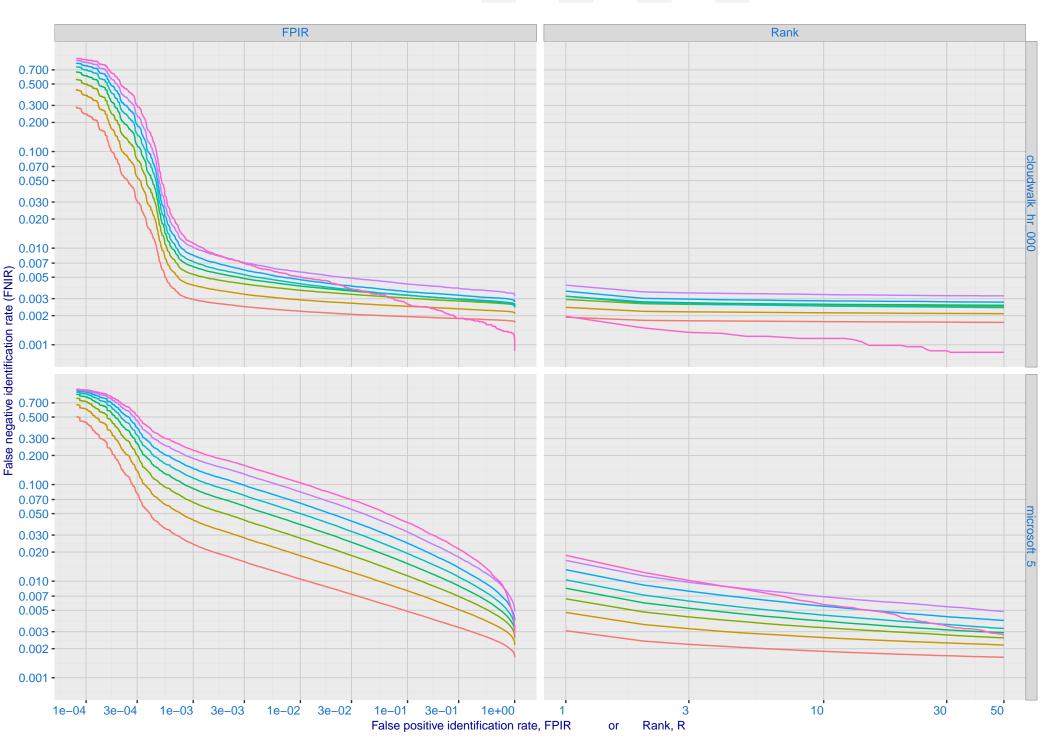
L: Investigational mode: FNIR(1600000, R, 0) by probe type microsoft_5 sensetime_005 0.100 -0.070 -0.050 -0.030 -0.020 enrolment_style False negative identification rate, FNIR(N) - 0.000 - lifetime_consolidated ---- random --- recent FNIR(R) N = 1600000 Immigration visa-border Immigration visa-kiosk Mugshot natural Mugshot webcam 0.002 -0.001 -10 30 10 30 Rank, R

M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations



Q: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing





R: Decline of genuine scores with ageing, with some eventually dropping below typical thresholds shown by the horizontal lines 1.0 -Dataset: 2018 Mugshot N= 3.1M Color encodes FNIR (Rank = 1) 0.8 -0.15 0.10 0.05 0.00 0.6 -TVAL - FPIR = 0.001 FPIR = 0.003 FPIR = 0.010FPIR = 0.030 0.4 -(00,02](02,04](04,06](06,08](08,10](10,12](12,14](14,18]Time lapse between search and initial encounter enrollment (years)