A: Datasheet

Algorithm: nec_2

Developer: NEC

Submission Date: 2018_10_30

Template size: 1616 bytes

Template time (2.5 percentile): 638 msec

Template time (median): 642 msec

Template time (97.5 percentile): 699 msec

Investigation:

Frontal mugshot ranking 4 (out of 279) -- FNIR(1600000, 0, 1) = 0.0010 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 12 (out of 241) -- FNIR(1600000, 0, 1) = 0.0088 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 44 (out of 210) -- FNIR(1600000, 0, 1) = 0.3628 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 23 (out of 168) — FNIR(1600000, 0, 1) = 0.0034 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 50 (out of 165) -- FNIR(1600000, 0, 1) = 0.1170 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

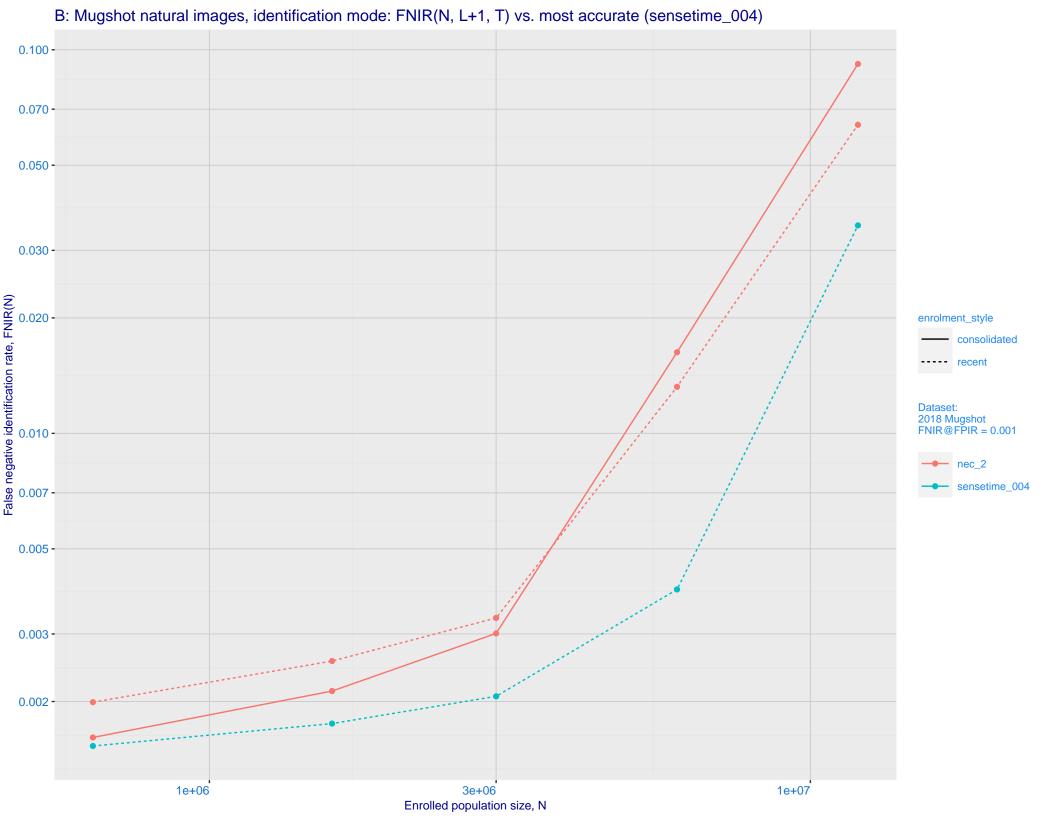
Frontal mugshot ranking 7 (out of 279) -- FNIR(1600000, T, L+1) = 0.0025, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

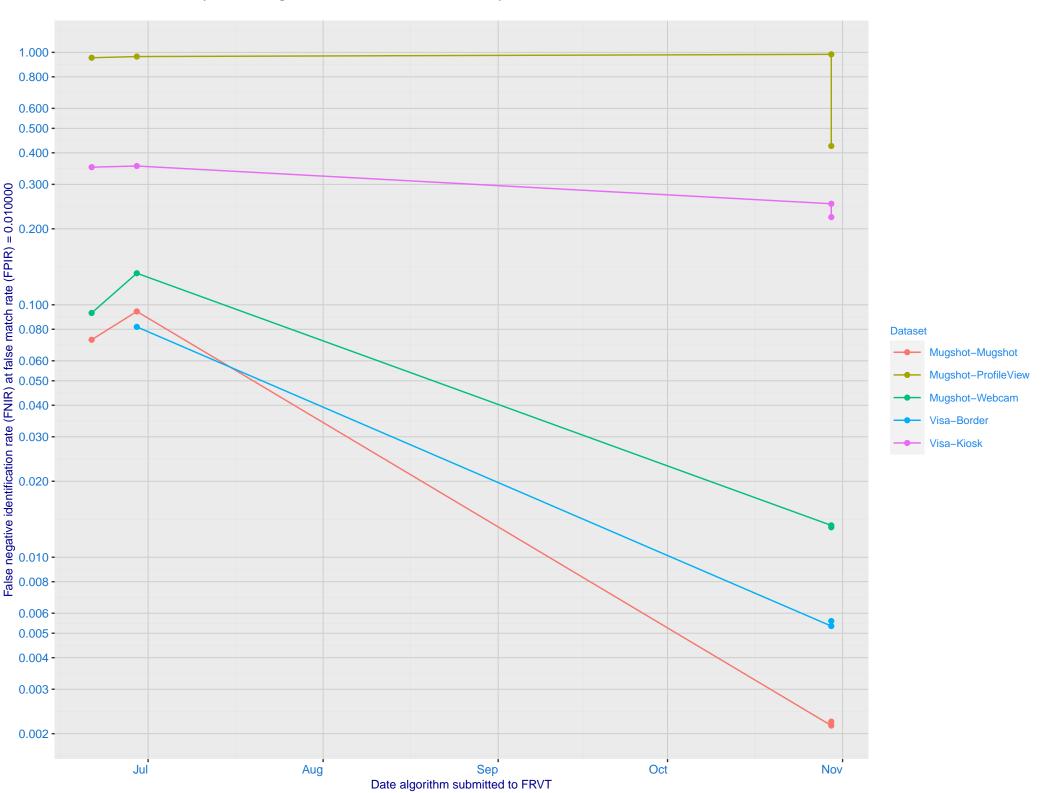
Mugshot webcam ranking 9 (out of 236) -- FNIR(1600000, T, L+1) = 0.0199, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 148 (out of 209) -- FNIR(1600000, T, L+1) = 0.9994, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 8 (out of 167) -- FNIR(1600000, T, L+1) = 0.0079, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 89 (out of 162) — FNIR(1600000, T, L+1) = 0.6822, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

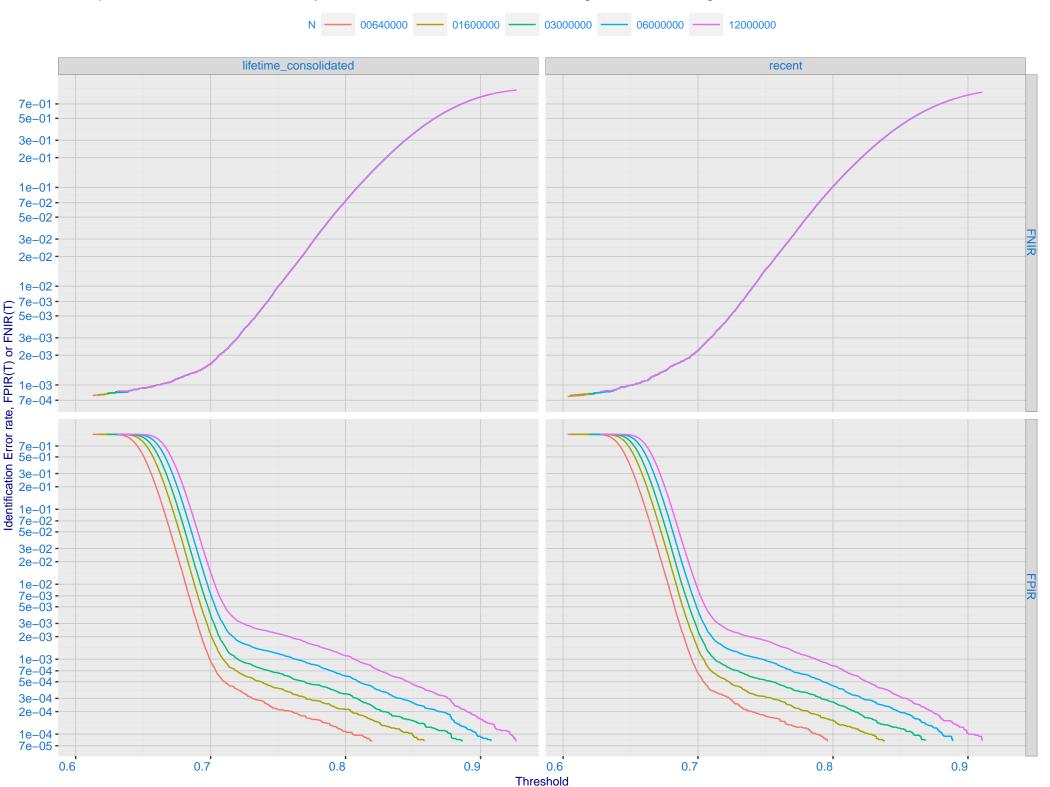




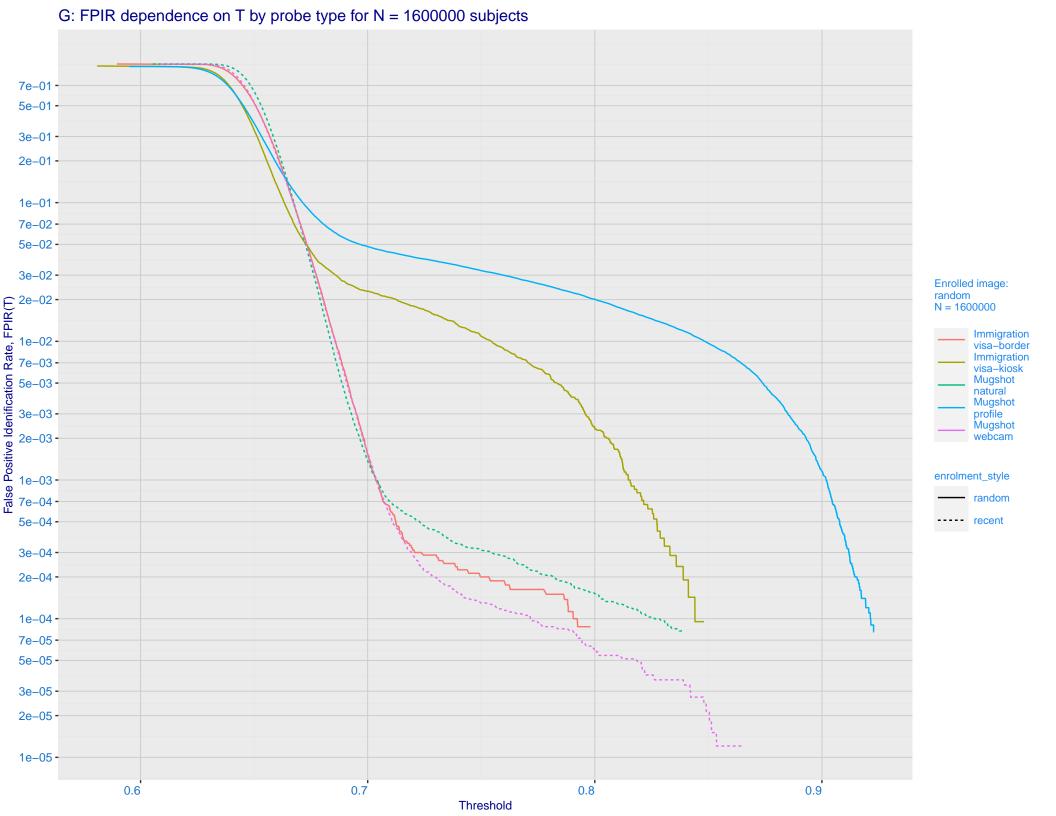
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 - 0.003 - 0.002 - 0.001 - 0.001 - 0.700 - 0.500 - 0.200 enrolment_style consolidated-ONE-MATE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

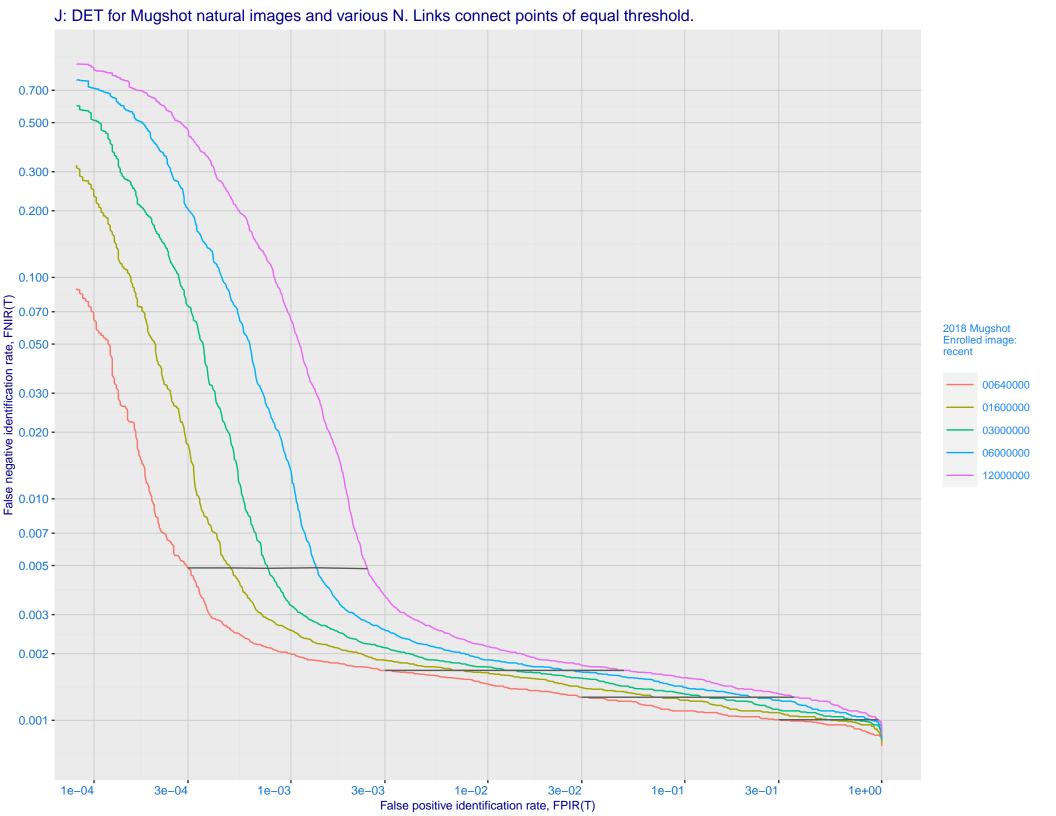
False positive identification rate, FPIR(T)

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 -1e-01 - 7e-02 - 7e-02 - 3e-02 - 2e-02 - 2e-02 - 3e-02 Enrolled images: recent N = 1600000Mugshot natural Mugshot webcam 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 -3e-05 -2e-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)

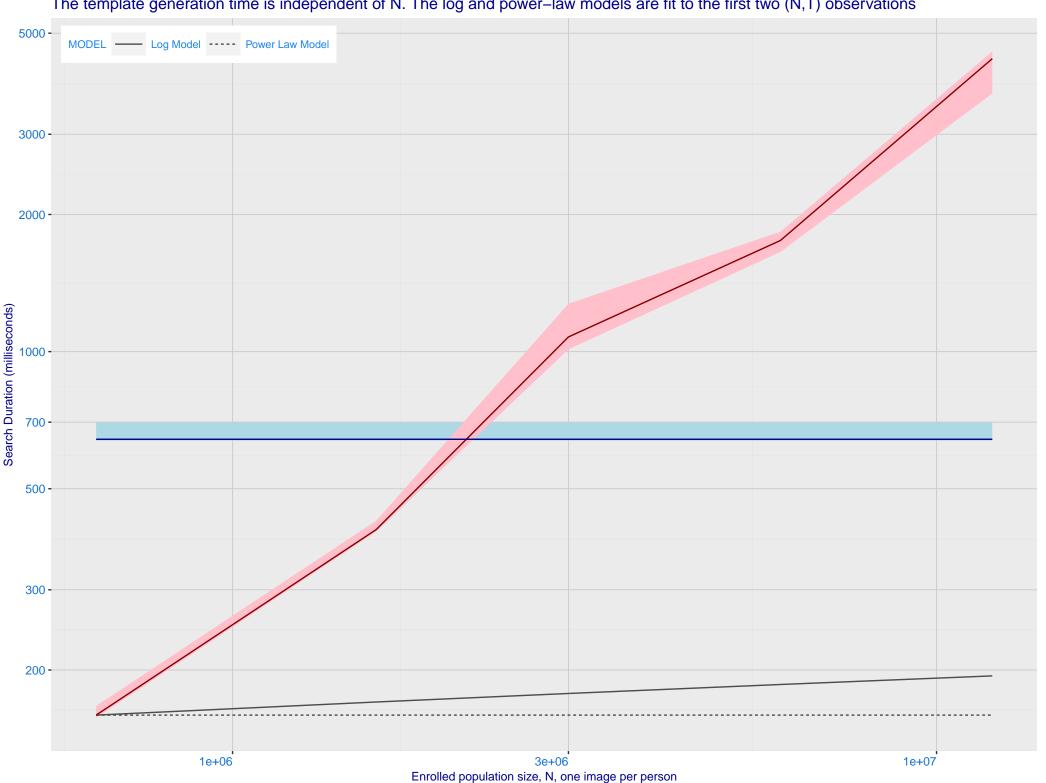


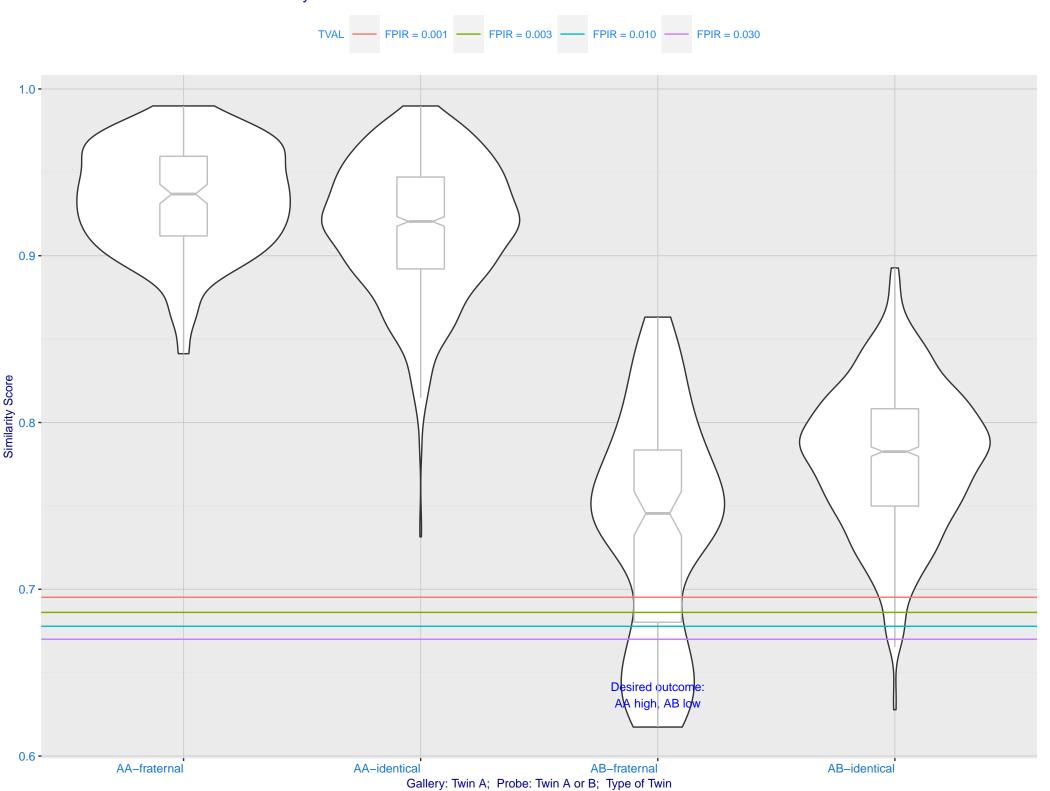


K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 - 0.002 - 0.001 - 0.001 - 0.000 - 0.000 - 0.050 enrolment_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 ____ nec_2 sensetime_005 0.030 -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 nec_2 sensetime_005 0.100 -0.070 -0.050 -0.030 enrolment_style Palse negative identification rate, FNIR(N) 0.000 - 0.000 - 0.000 - 0.0005 lifetime_consolidated ---- random --- recent FNIR(R) N = 1600000 Immigration visa-border Immigration visa-kiosk Mugshot natural Mugshot webcam 0.003 -0.002 -0.001 -3 10 30 3 10 30 Rank, R

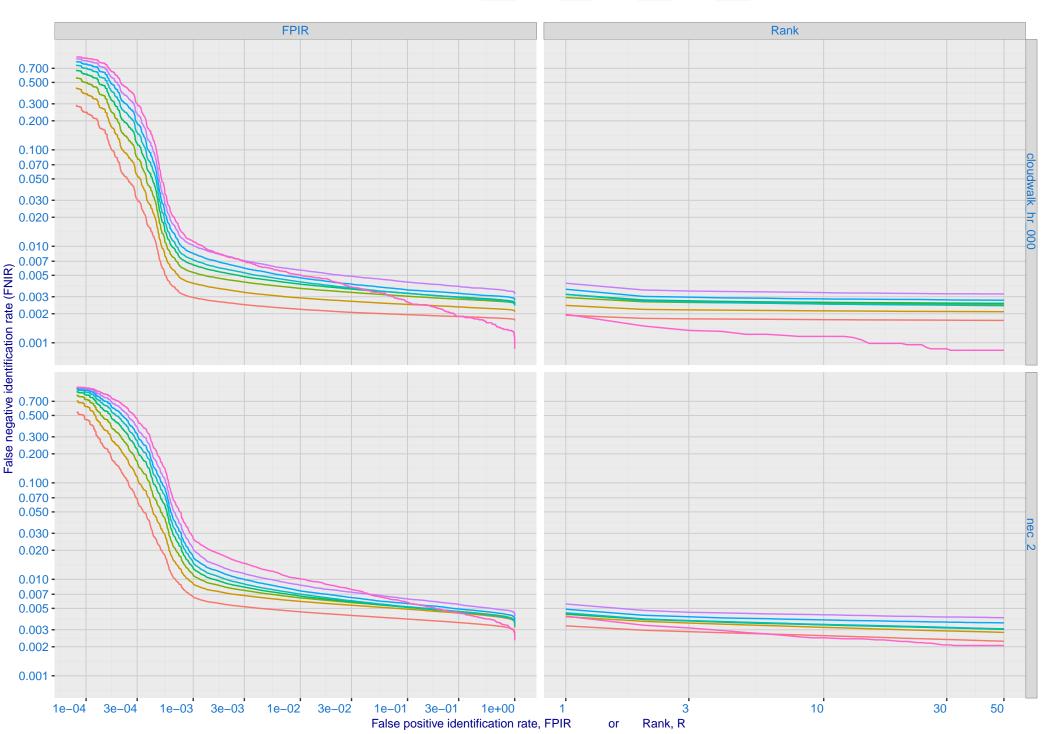
M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations





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) 0.9 -0.15 0.10 0.05 0.00 TVAL - FPIR = 0.001 FPIR = 0.003 0.7 -FPIR = 0.010FPIR = 0.030 0.6 -(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)