A: Datasheet

Algorithm: dermalog_007

Developer: Dermalog

Submission Date: 2020_02_12

Template size: 128 bytes

Template time (2.5 percentile): 386 msec

Template time (median): 411 msec

Template time (97.5 percentile): 456 msec

Investigation:

Frontal mugshot ranking 133 (out of 279) -- FNIR(1600000, 0, 1) = 0.0092 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 115 (out of 241) -- FNIR(1600000, 0, 1) = 0.0267 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 83 (out of 210) -- FNIR(1600000, 0, 1) = 0.6746 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 83 (out of 168) -- FNIR(1600000, 0, 1) = 0.0143 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 82 (out of 165) -- FNIR(1600000, 0, 1) = 0.1696 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

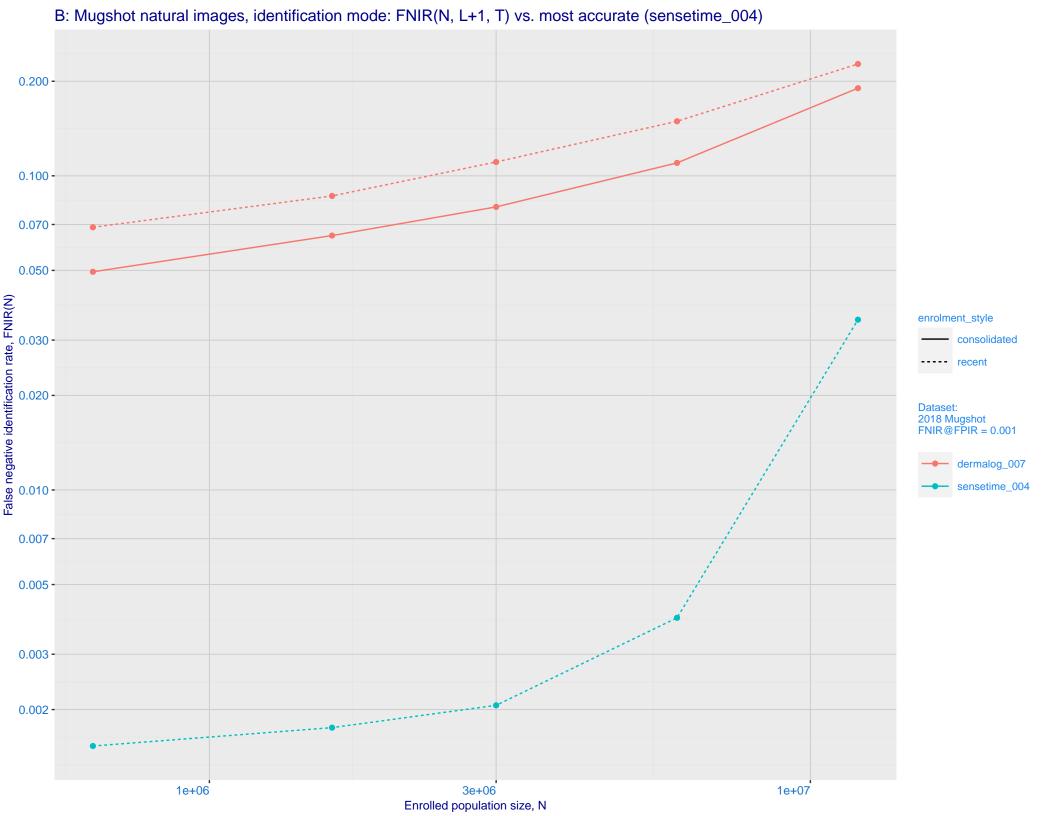
Frontal mugshot ranking 134 (out of 279) -- FNIR(1600000, T, L+1) = 0.0863, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

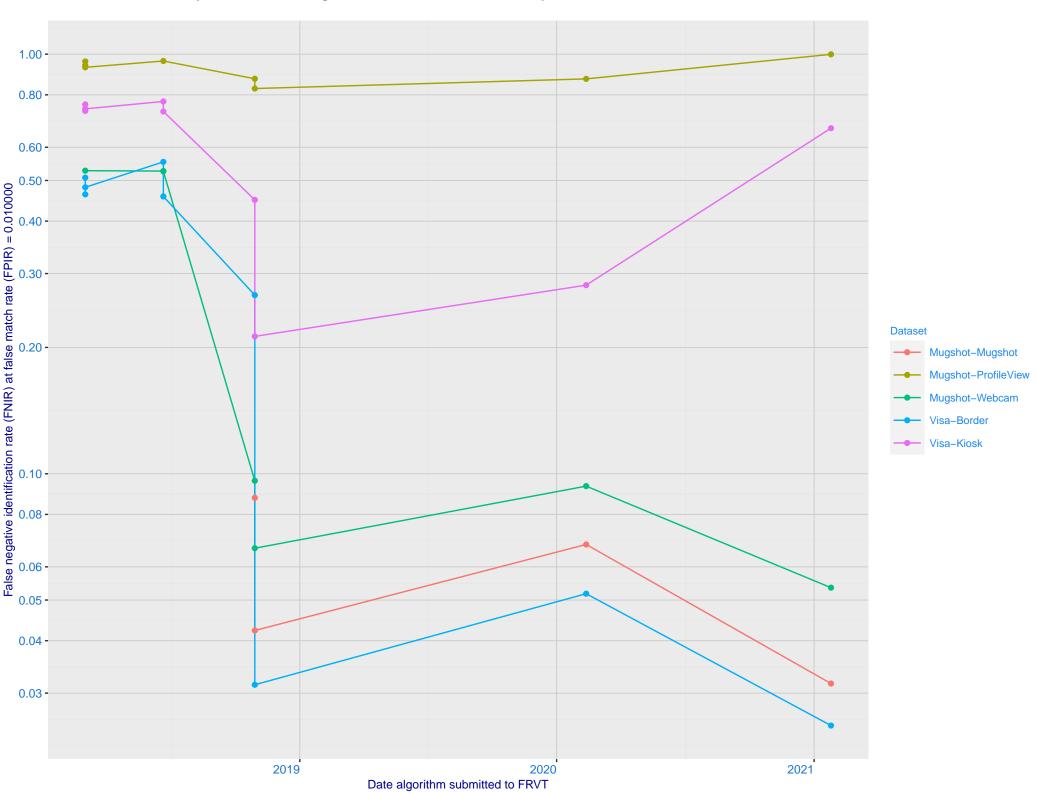
Mugshot webcam ranking 116 (out of 236) -- FNIR(1600000, T, L+1) = 0.1524, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 86 (out of 209) — FNIR(1600000, T, L+1) = 0.9902, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 80 (out of 167) -- FNIR(1600000, T, L+1) = 0.0989, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 81 (out of 162) — FNIR(1600000, T, L+1) = 0.5590, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

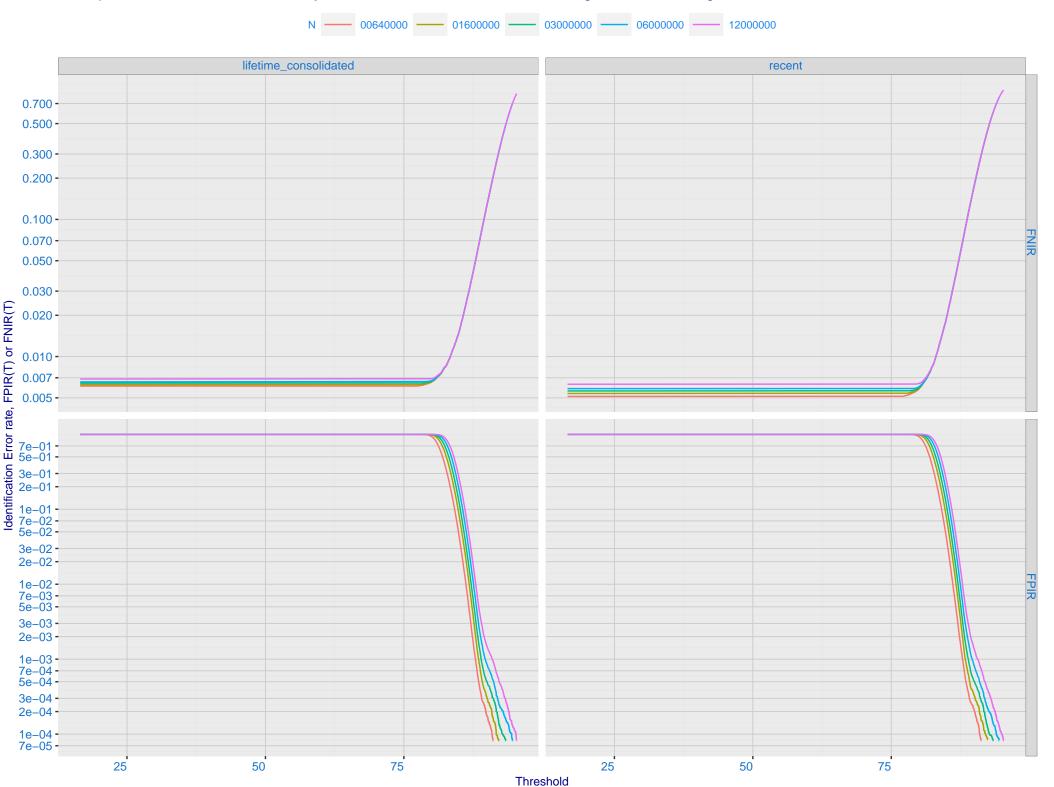




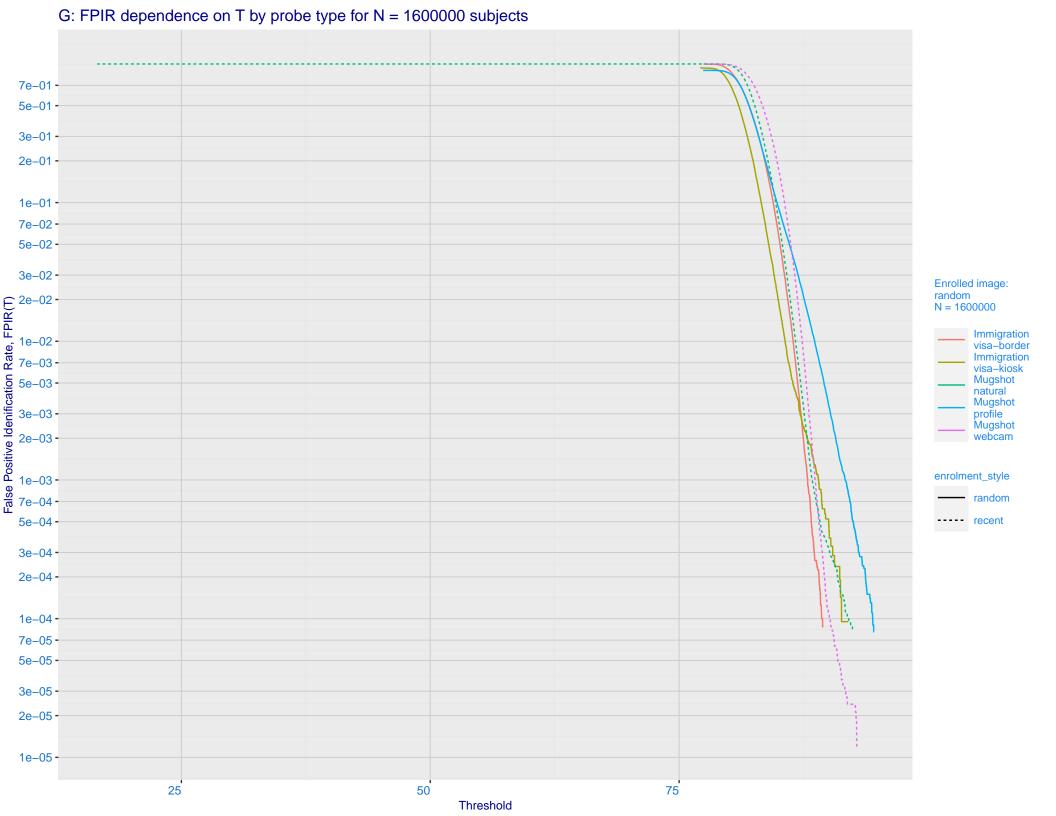
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 dermalog 007 0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.000 - 0.000 - 0.500 - 0.200 - 0. enrolment_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.100 -0.070 sensetime 004 0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

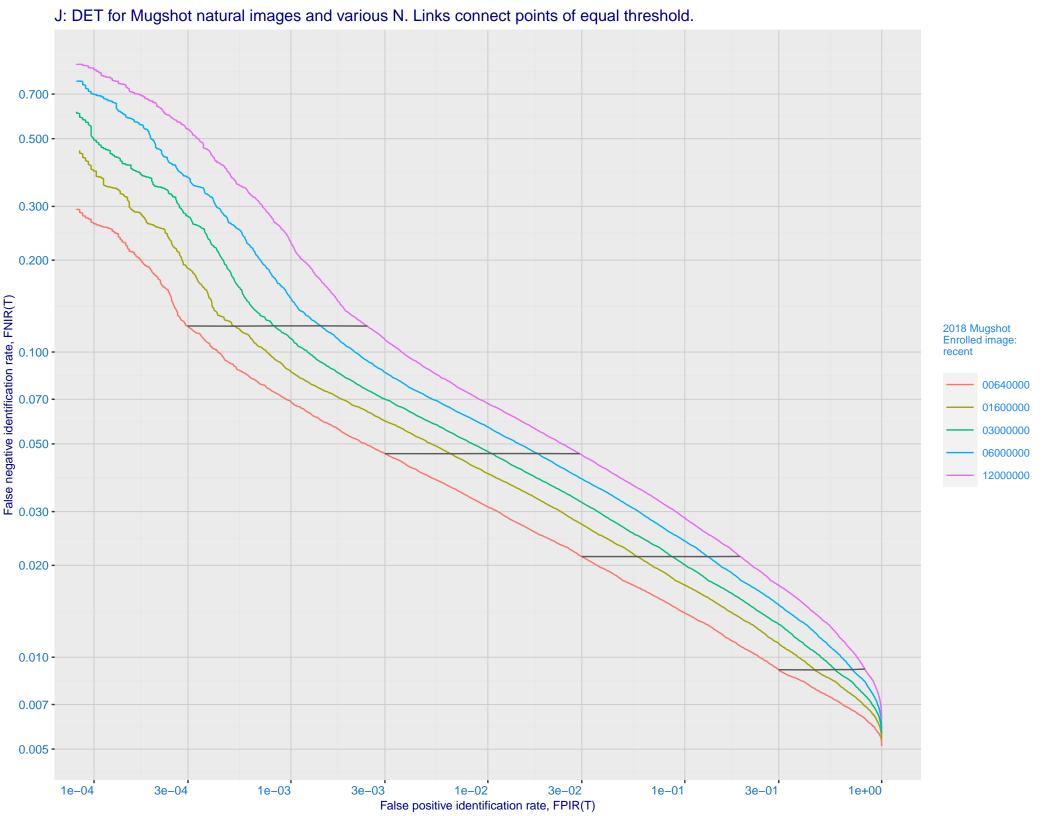
False positive identification rate, FPIR(T)

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

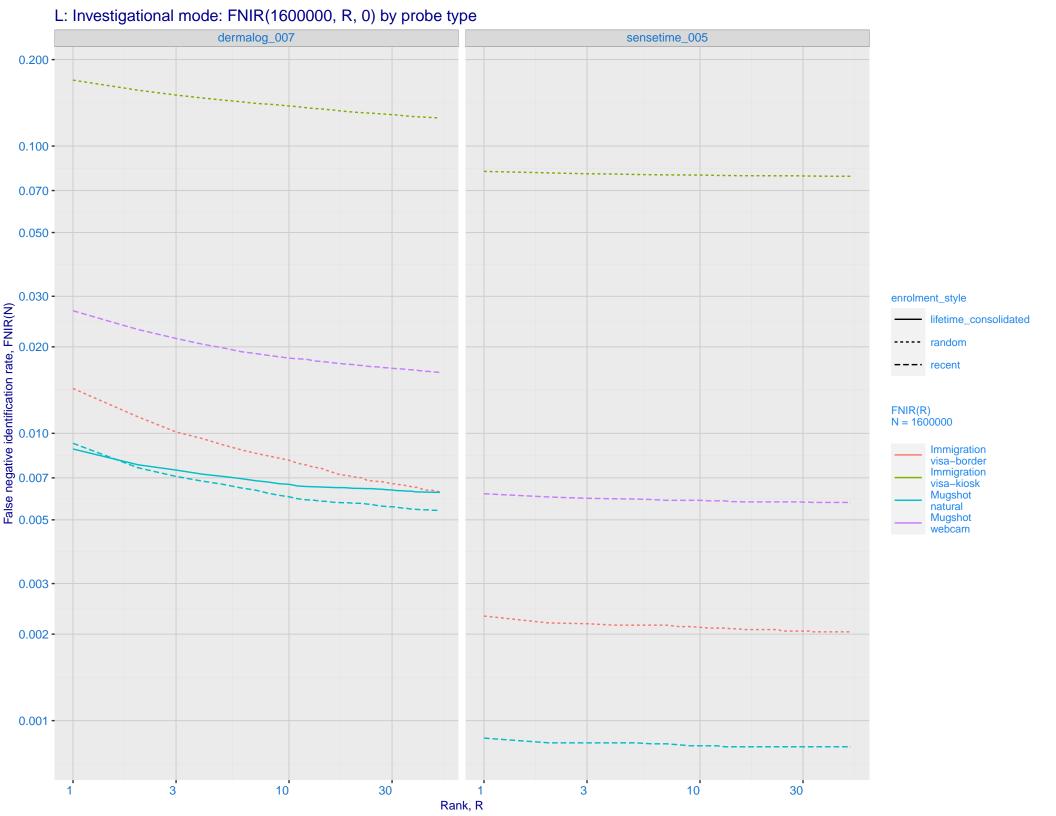


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -5e-02 -2e-02 -Enrolled images: recent N = 1600000 Mugshot natural Mugshot webcam 1e-02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

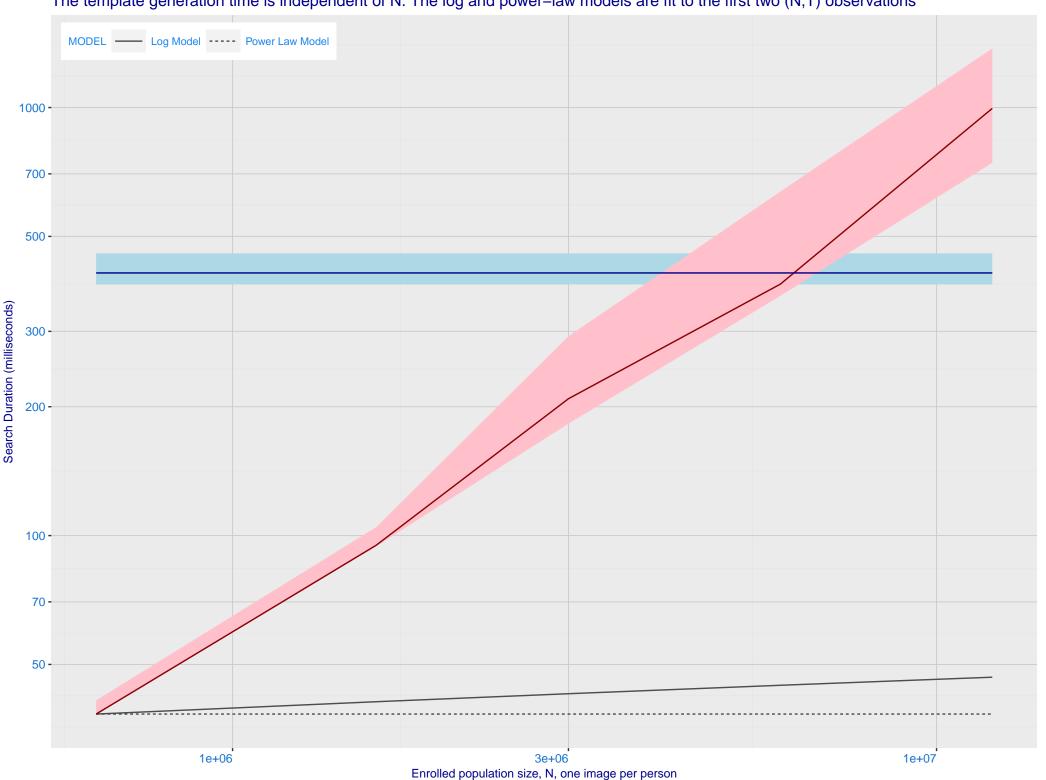




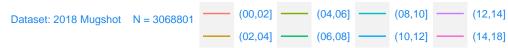
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0. enrolment_style consolidated ---- random --- recent Mugshot Mugshot webcam natural FNIR@Rank = 1 dermalog_007 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

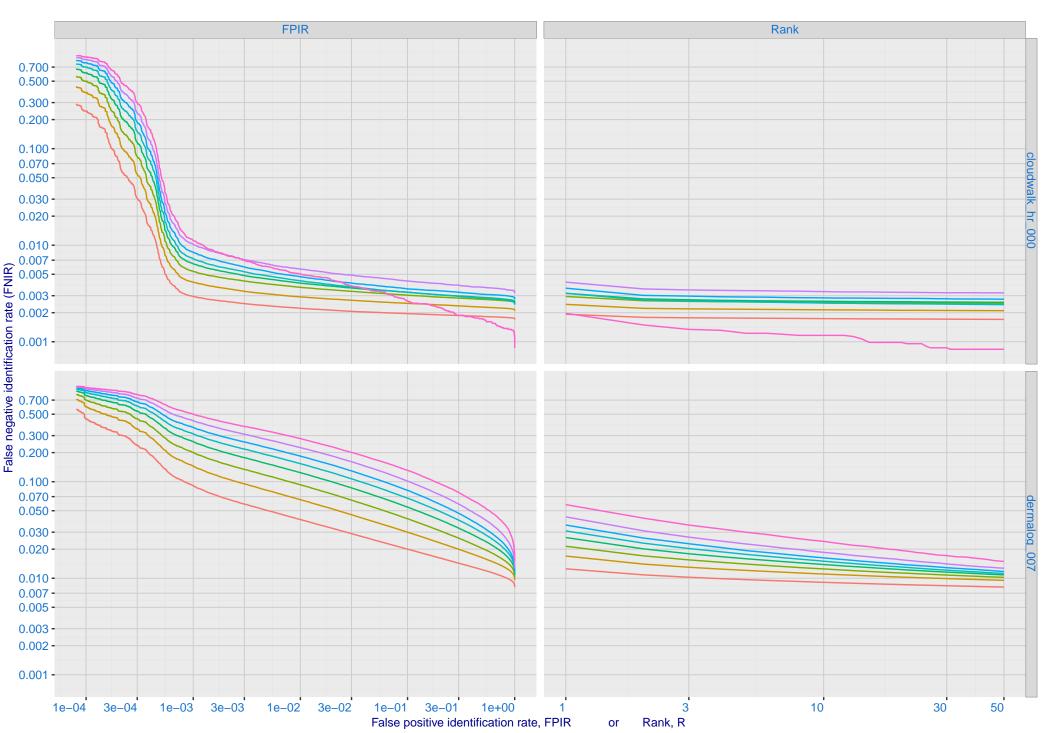


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations



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 100 -Dataset: 2018 Mugshot N= 3.1M Color encodes FNIR (Rank = 1) 95 -0.15 0.10 90 -0.05 0.00 TVAL 85 -- FPIR = 0.001 FPIR = 0.003 FPIR = 0.010FPIR = 0.030 80 -(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)