## A: Datasheet

Algorithm: ntechlab\_6

Developer: N-Tech Lab

Submission Date: 2018\_10\_30

Template size: 1940 bytes

Template time (2.5 percentile): 828 msec

Template time (median): 831 msec

Template time (97.5 percentile): 886 msec

Investigation:

Frontal mugshot ranking 82 (out of 279) -- FNIR(1600000, 0, 1) = 0.0041 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 67 (out of 241) -- FNIR(1600000, 0, 1) = 0.0166 vs. lowest 0.0062 from sensetime\_005

Mugshot profile ranking 42 (out of 210) -- FNIR(1600000, 0, 1) = 0.3473 vs. lowest 0.0587 from xforwardai\_002

Immigration visa-border ranking 60 (out of 168) -- FNIR(1600000, 0, 1) = 0.0073 vs. lowest 0.0013 from visionlabs\_010

Immigration visa-kiosk ranking 49 (out of 165) -- FNIR(1600000, 0, 1) = 0.1133 vs. lowest 0.0568 from cloudwalk\_hr\_000

Identification:

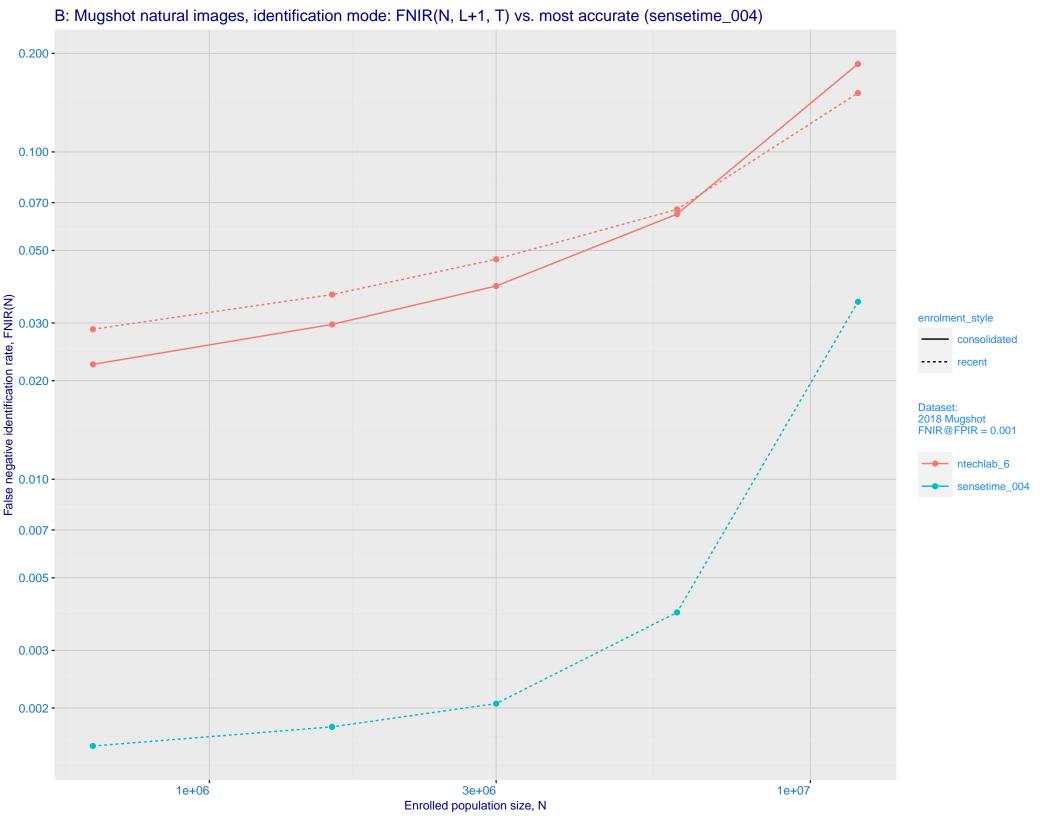
Frontal mugshot ranking 68 (out of 279) -- FNIR(1600000, T, L+1) = 0.0366, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

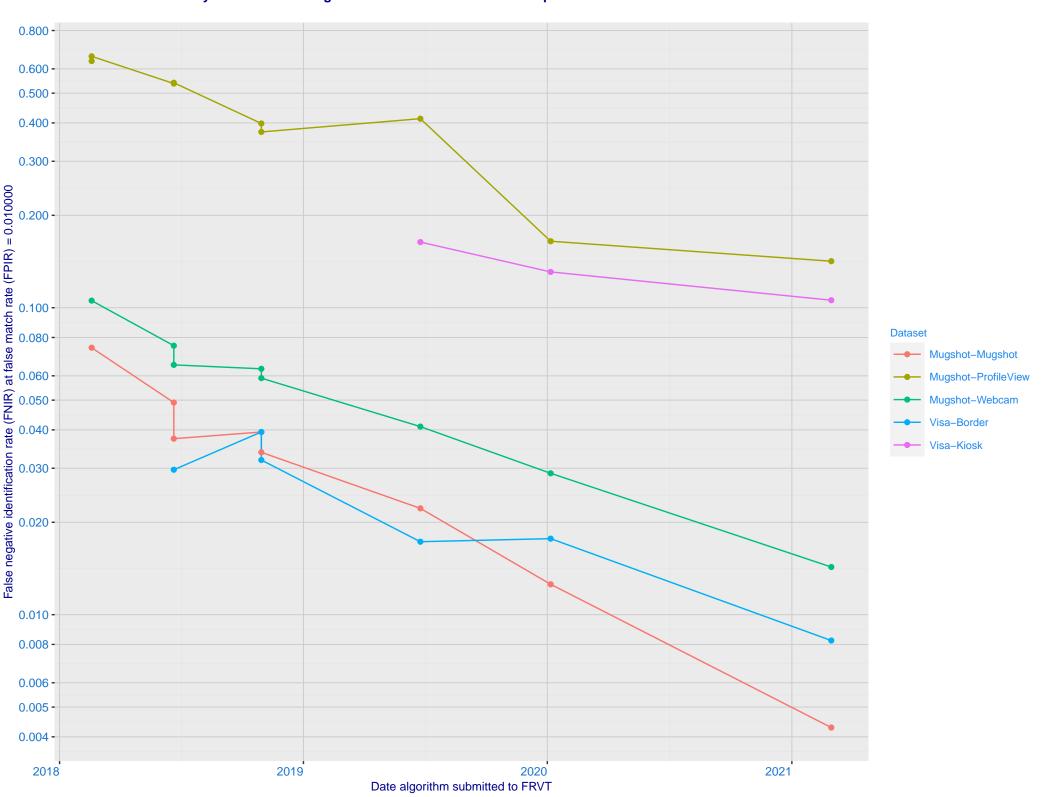
Mugshot webcam ranking 67 (out of 236) -- FNIR(1600000, T, L+1) = 0.0941, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

Mugshot profile ranking 21 (out of 209) -- FNIR(1600000, T, L+1) = 0.7545, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk\_hr\_000

Immigration visa-border ranking 58 (out of 167) -- FNIR(1600000, T, L+1) = 0.0574, FPIR=0.001000 vs. lowest 0.0047 from idemia\_008

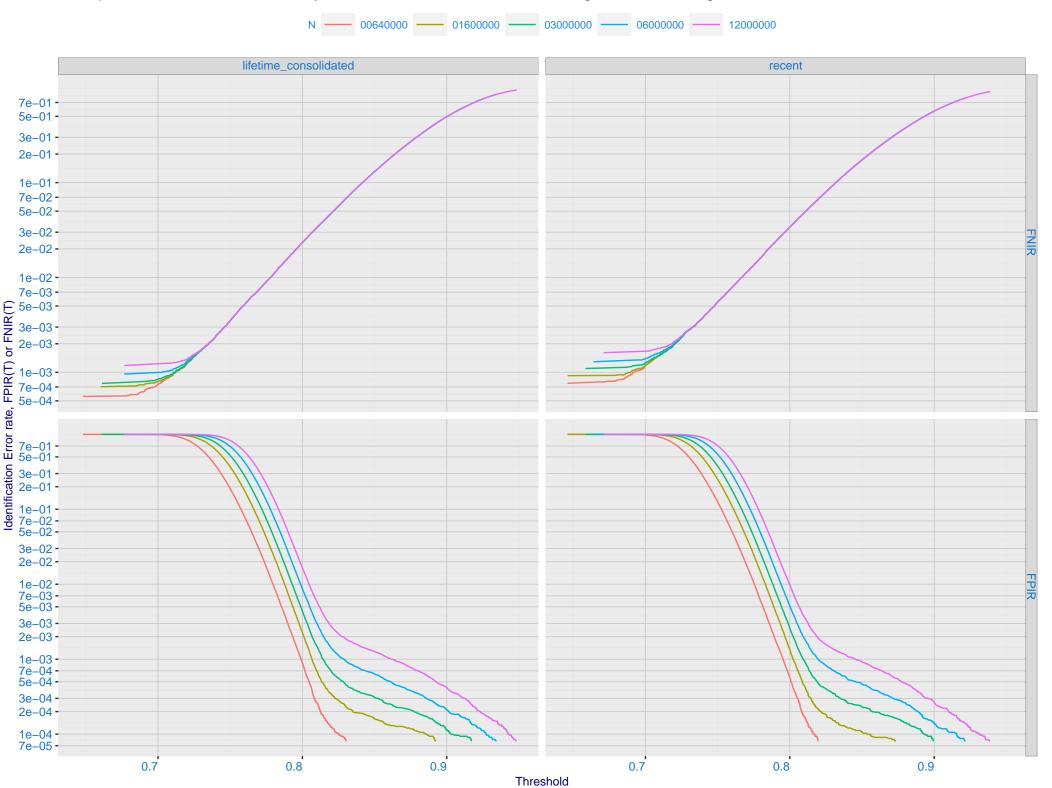
Immigration visa-kiosk ranking 35 (out of 162) — FNIR(1600000, T, L+1) = 0.2605, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk\_hr\_000



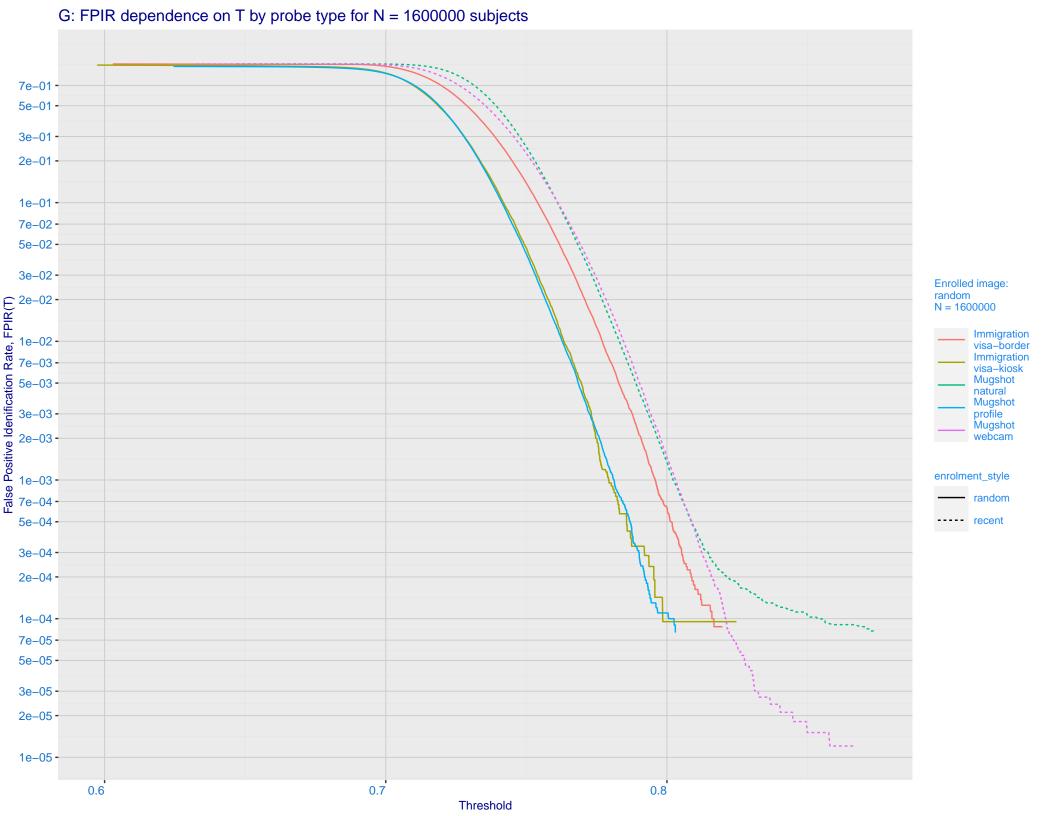


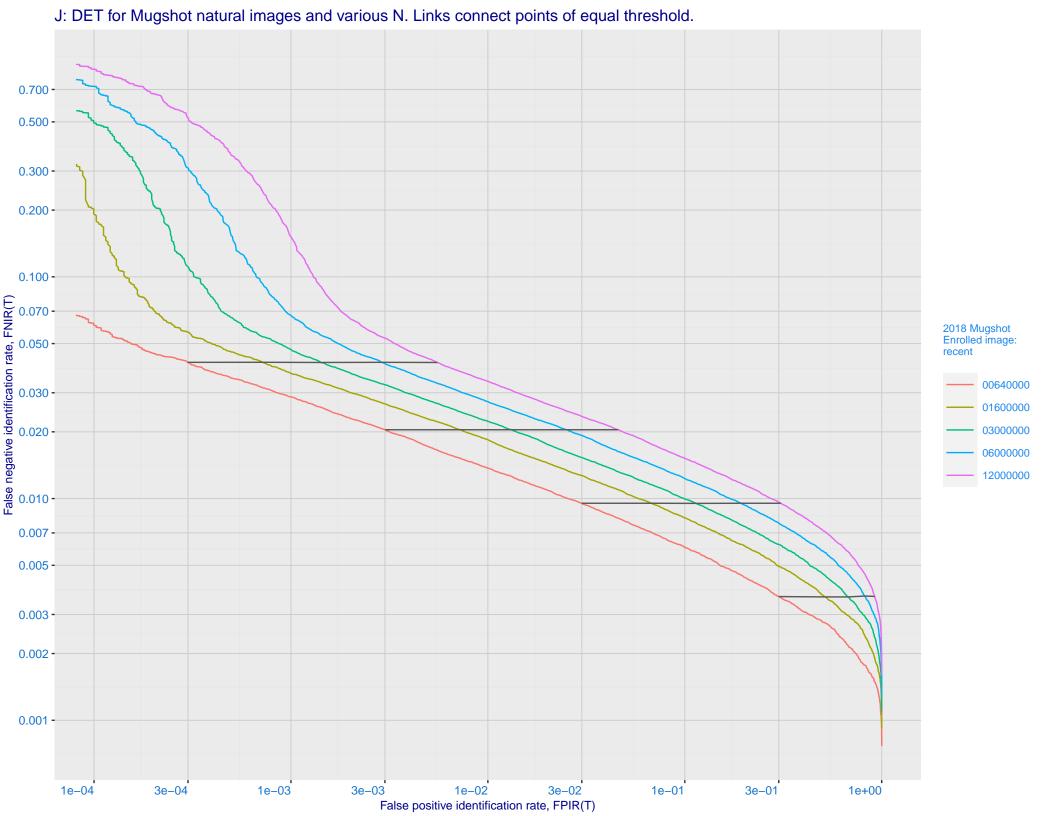
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -O.005 - 0.003 - 0.002 - 0.001 - 0.001 - 0.500 - 0.500 - 0.200 - 0.100 enrolment\_style 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 -

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

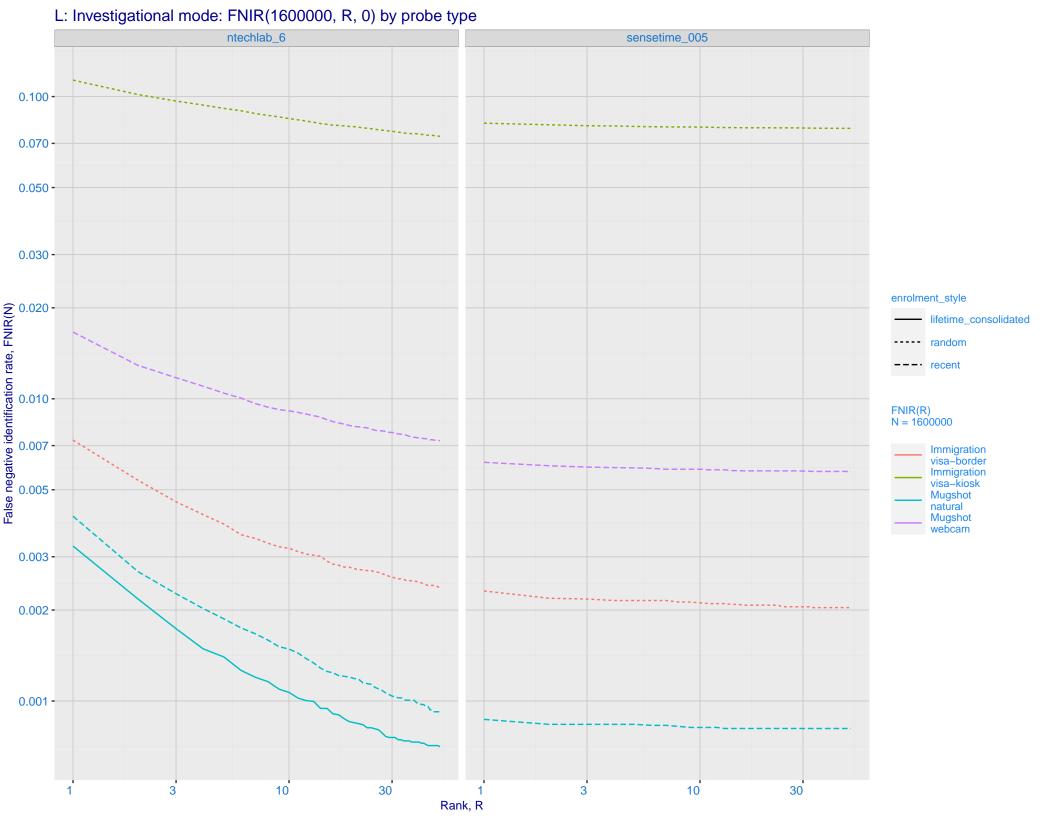


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam 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 -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)

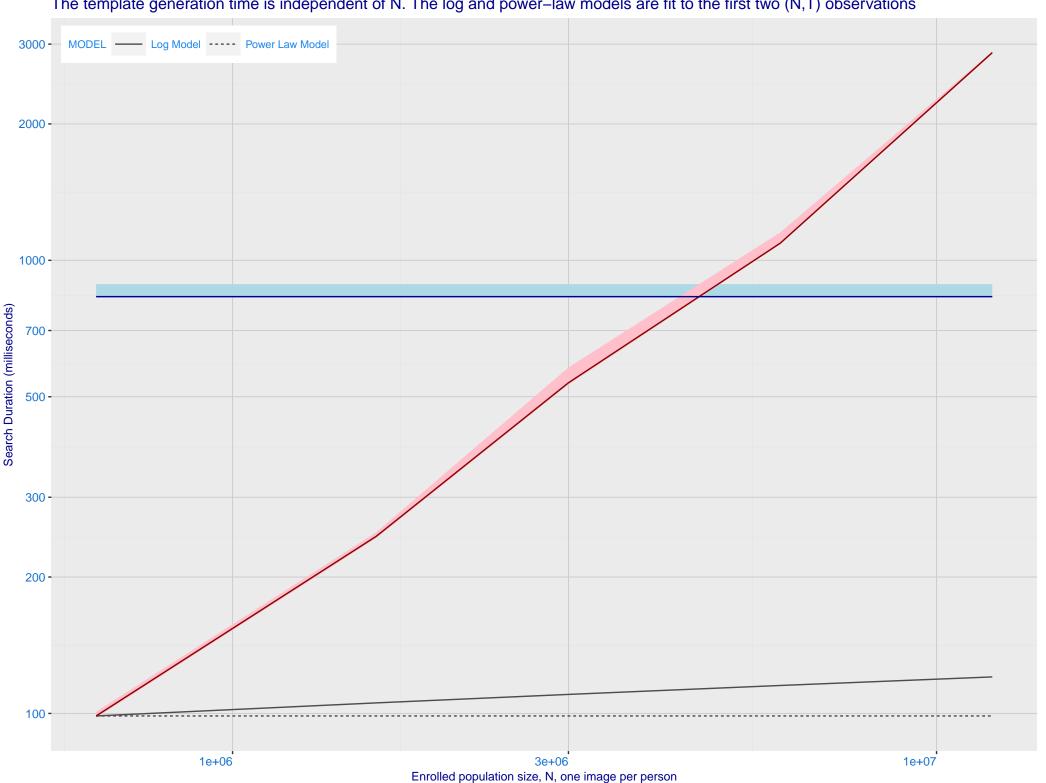


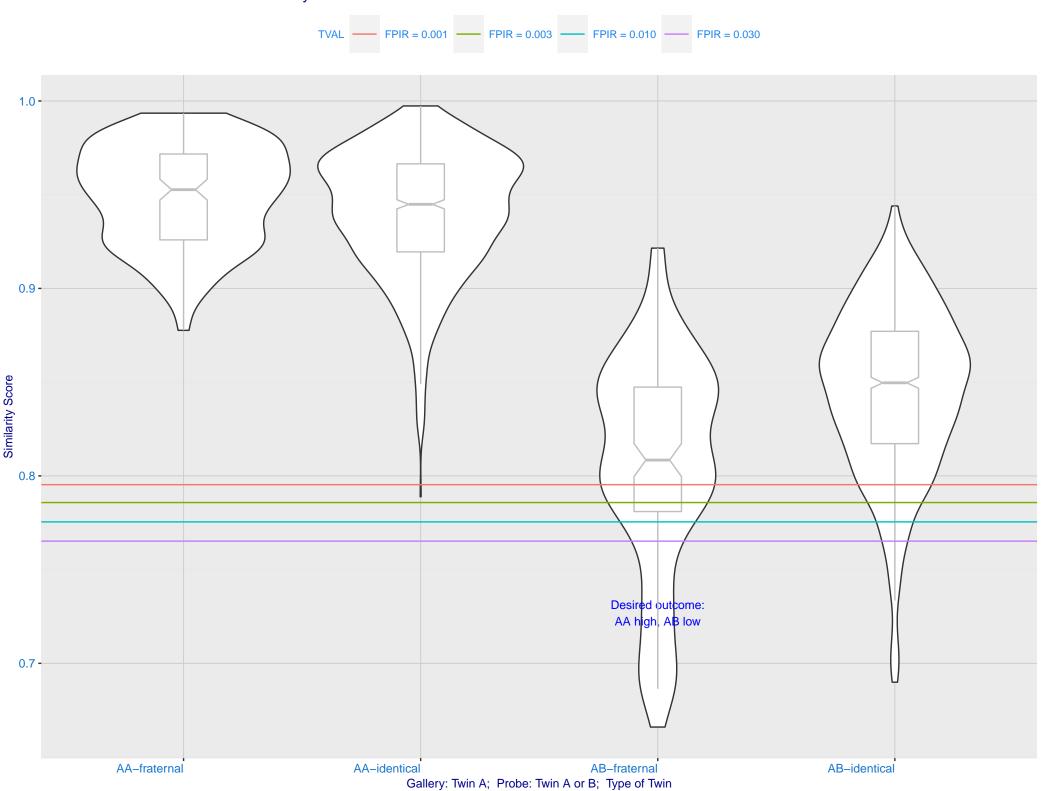


K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 - 0.002 - 0.001 - 0.001 - 0.000 - 0.000 - 0.050 enrolment\_style consolidated ---- random --- recent Mugshot Mugshot webcam natural FNIR@Rank = 1 ntechlab\_6 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

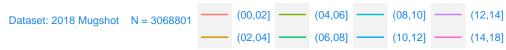


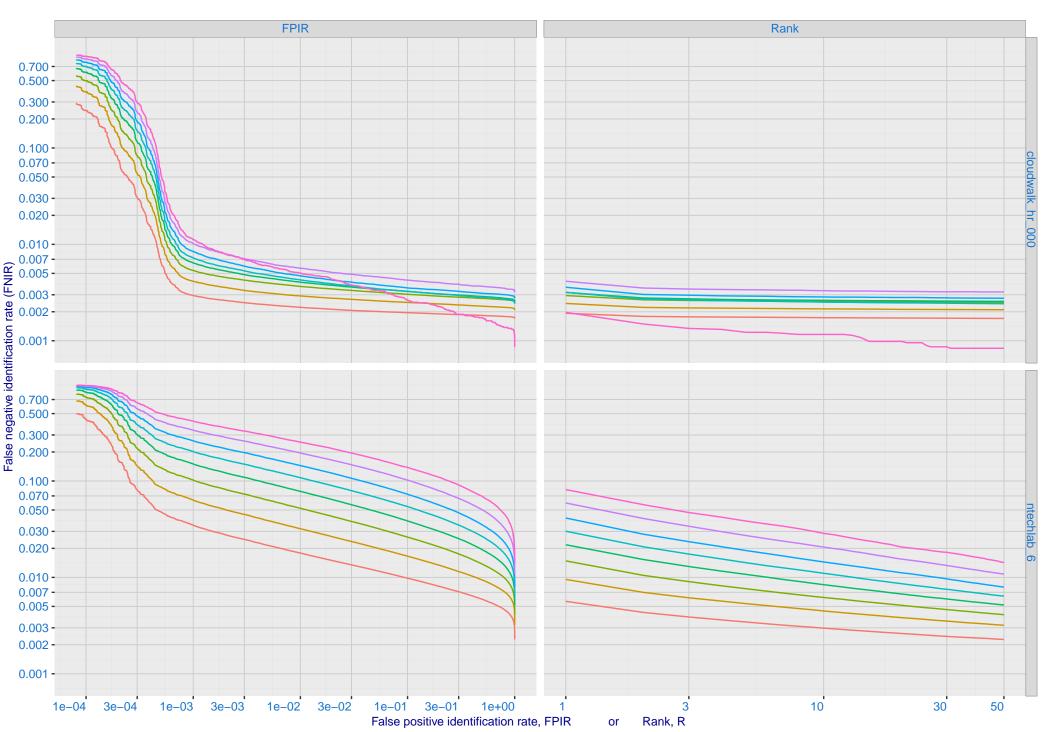
M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations





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 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 FPIR = 0.0100.7 -FPIR = 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)