A: Datasheet

Algorithm: hik_5

Developer: Hikvision Research Institute

Submission Date: 2018_10_29

Template size: 1408 bytes

Template time (2.5 percentile): 607 msec

Template time (median): 608 msec

Template time (97.5 percentile): 657 msec

Investigation:

Frontal mugshot ranking 90 (out of 279) -- FNIR(1600000, 0, 1) = 0.0046 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 63 (out of 241) -- FNIR(1600000, 0, 1) = 0.0165 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 64 (out of 210) -- FNIR(1600000, 0, 1) = 0.5351 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 58 (out of 168) -- FNIR(1600000, 0, 1) = 0.0069 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 45 (out of 165) -- FNIR(1600000, 0, 1) = 0.1109 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

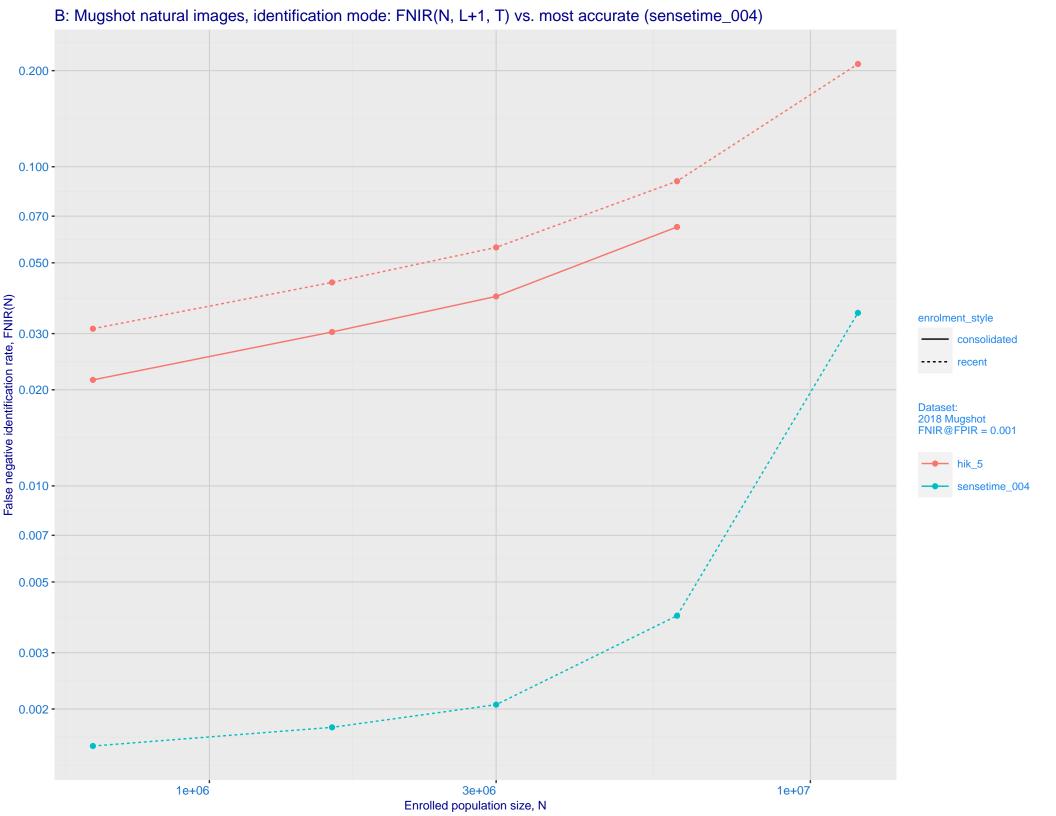
Frontal mugshot ranking 77 (out of 279) -- FNIR(1600000, T, L+1) = 0.0434, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 51 (out of 236) -- FNIR(1600000, T, L+1) = 0.0766, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

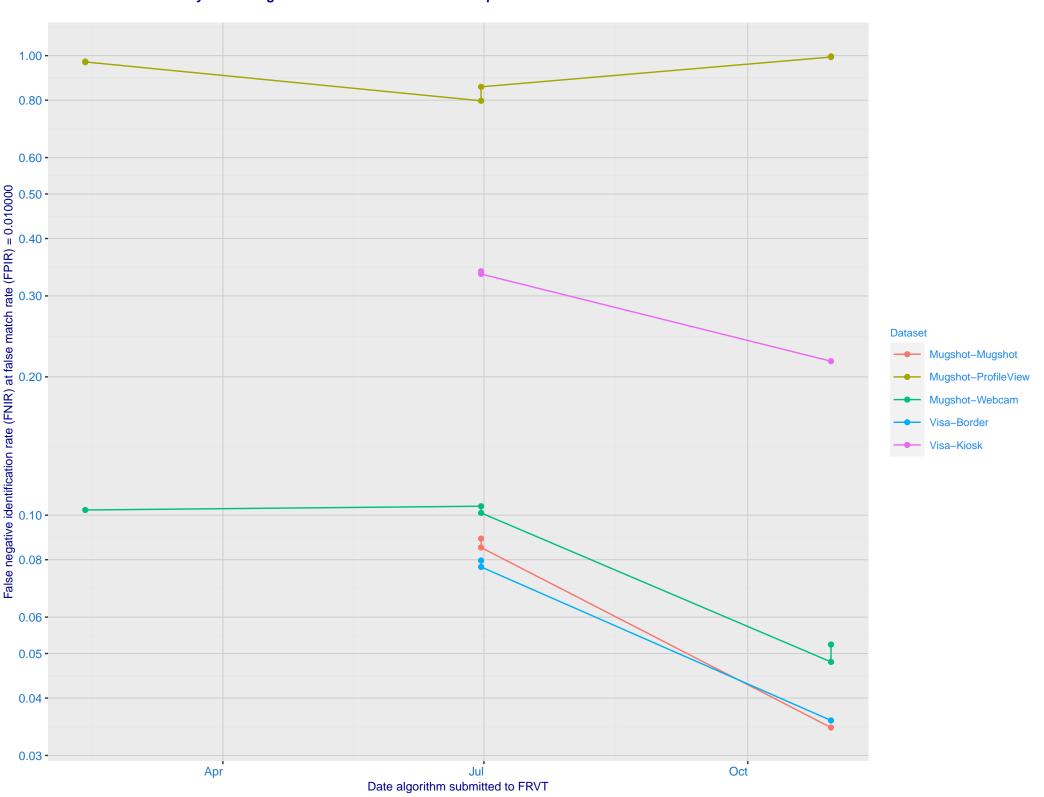
Mugshot profile ranking 154 (out of 209) -- FNIR(1600000, T, L+1) = 0.9994, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 67 (out of 167) -- FNIR(1600000, T, L+1) = 0.0677, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 79 (out of 162) — FNIR(1600000, T, L+1) = 0.5449, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000



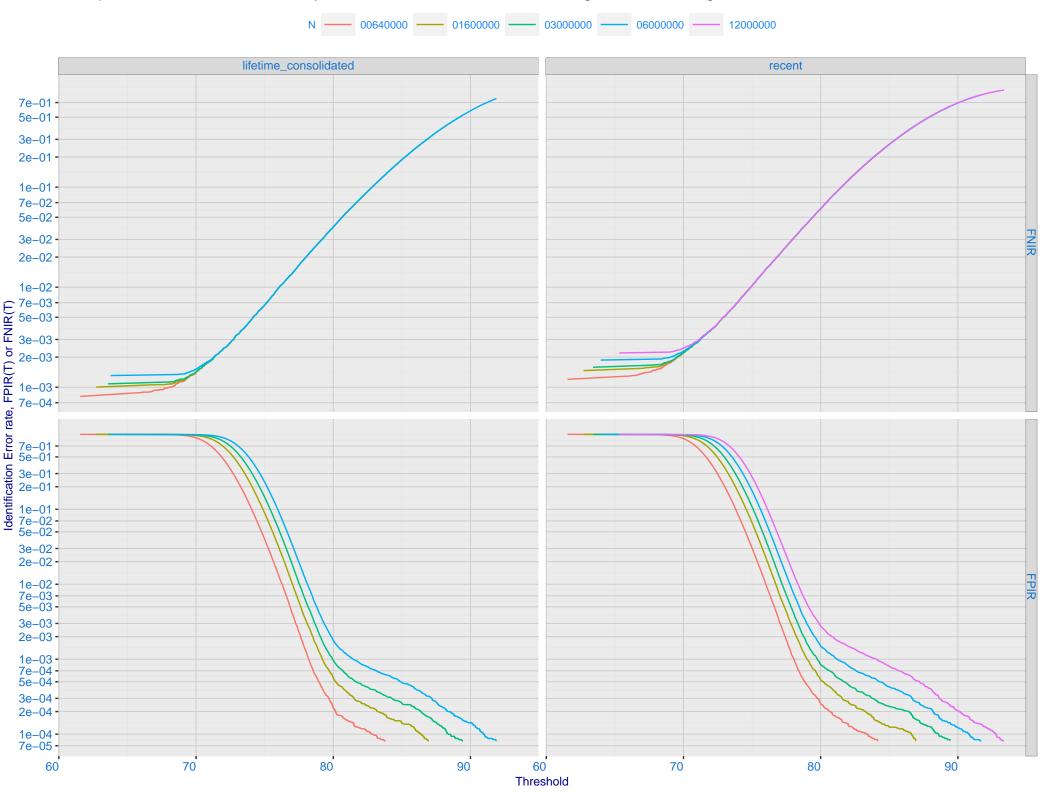
C: Evolution of accuracy for HIK algorithms on three datasets 2018 - present



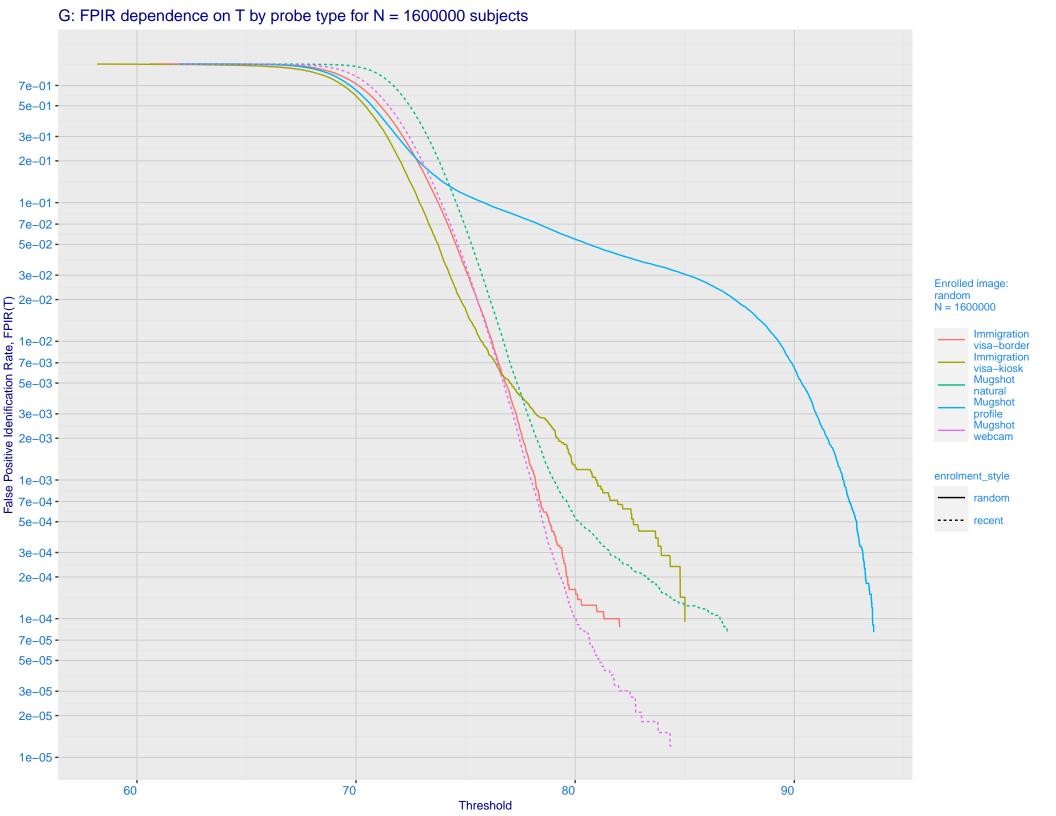
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.0001 - 0.0001 - 0.500 - 0.200 enrolment_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.100 -0.070 sensetime 004 0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

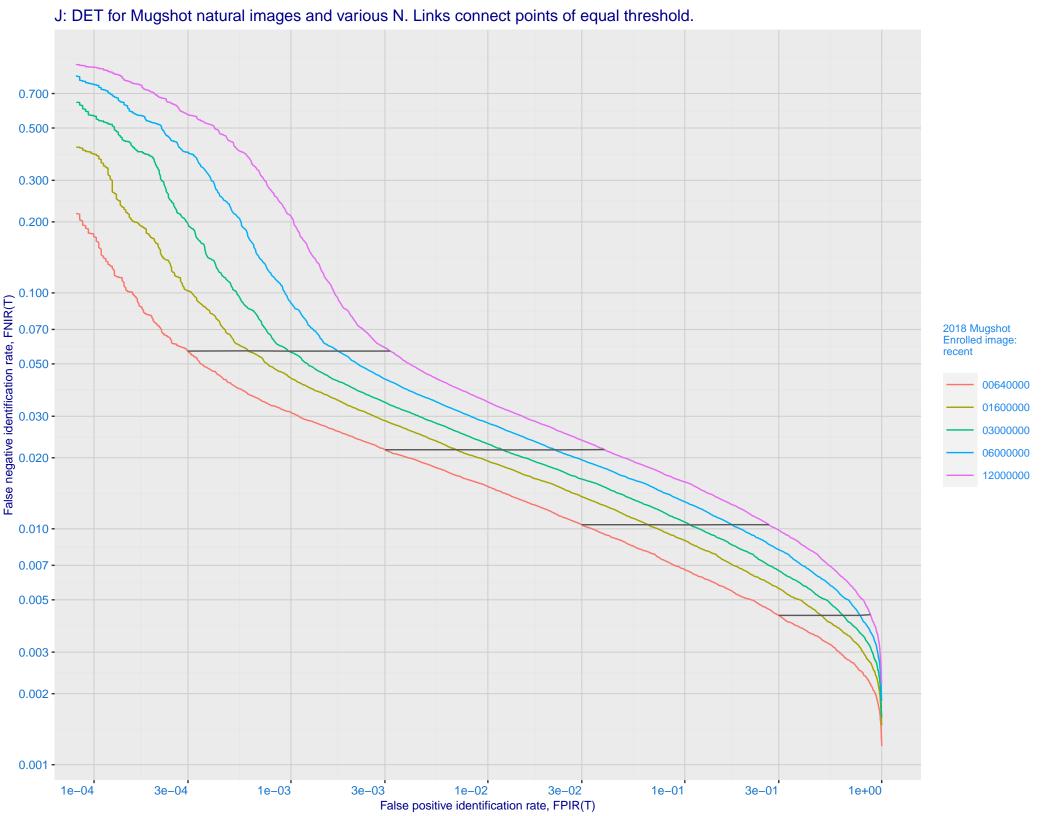
False positive identification rate, FPIR(T)

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

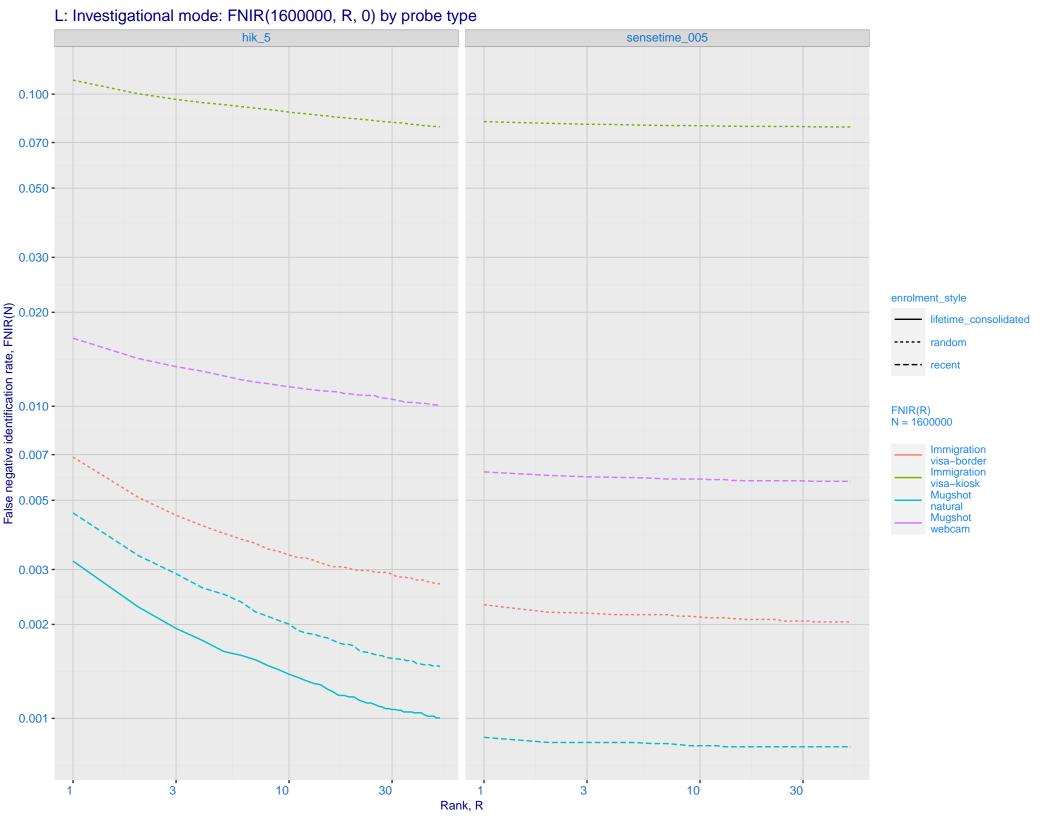


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

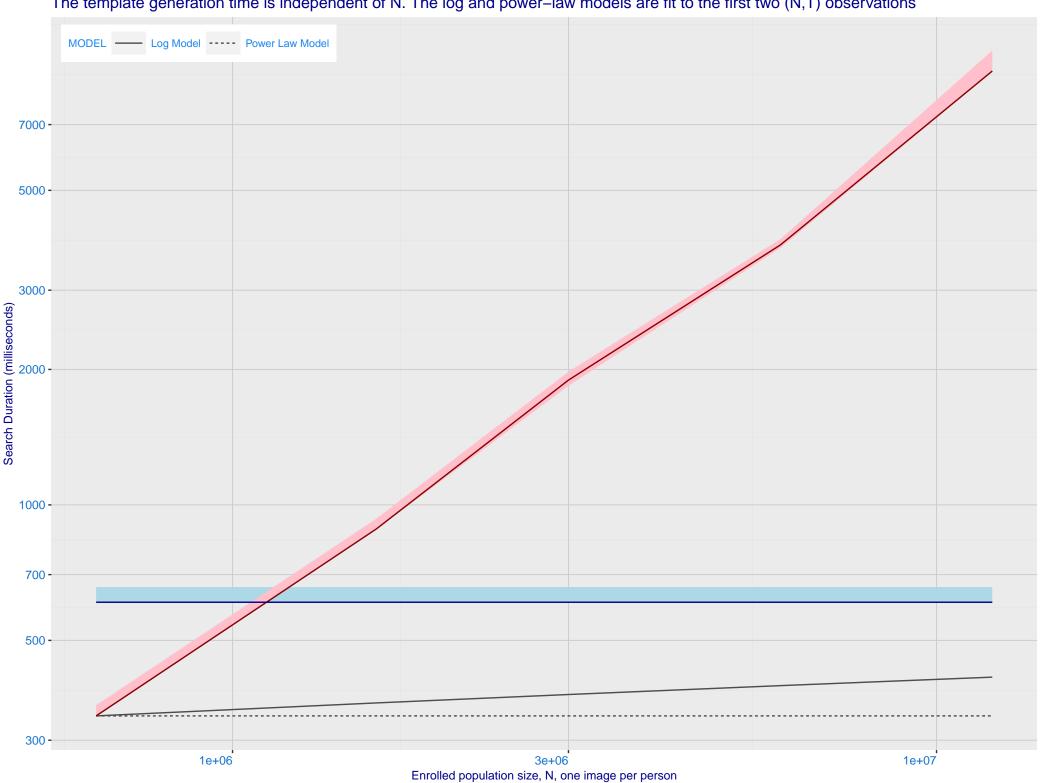


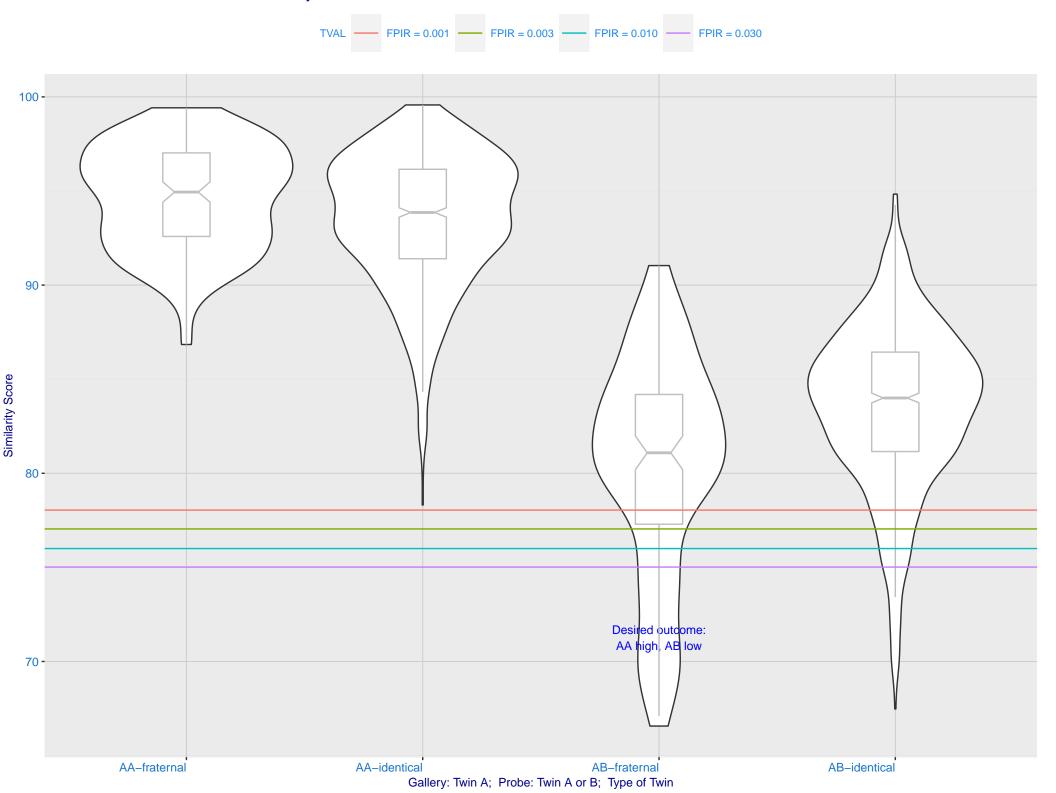


K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 - 0.002 - 0.001 - 0.001 - 0.000 - 0.000 - 0.050 enrolment_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 -- hik_5 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



