A: Datasheet

Algorithm: ayonix_2

Developer: Ayonix

Submission Date: 2018_10_30

Template size: 1036 bytes

Template time (2.5 percentile): 10 msec

Template time (median): 12 msec

Template time (97.5 percentile): 14 msec

Investigation:

Frontal mugshot ranking 264 (out of 279) -- FNIR(1600000, 0, 1) = 0.3414 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 228 (out of 241) -- FNIR(1600000, 0, 1) = 0.5272 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 202 (out of 210) — FNIR(1600000, 0, 1) = 0.9927 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 147 (out of 168) -- FNIR(1600000, 0, 1) = 0.4643 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 152 (out of 165) -- FNIR(1600000, 0, 1) = 0.7784 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

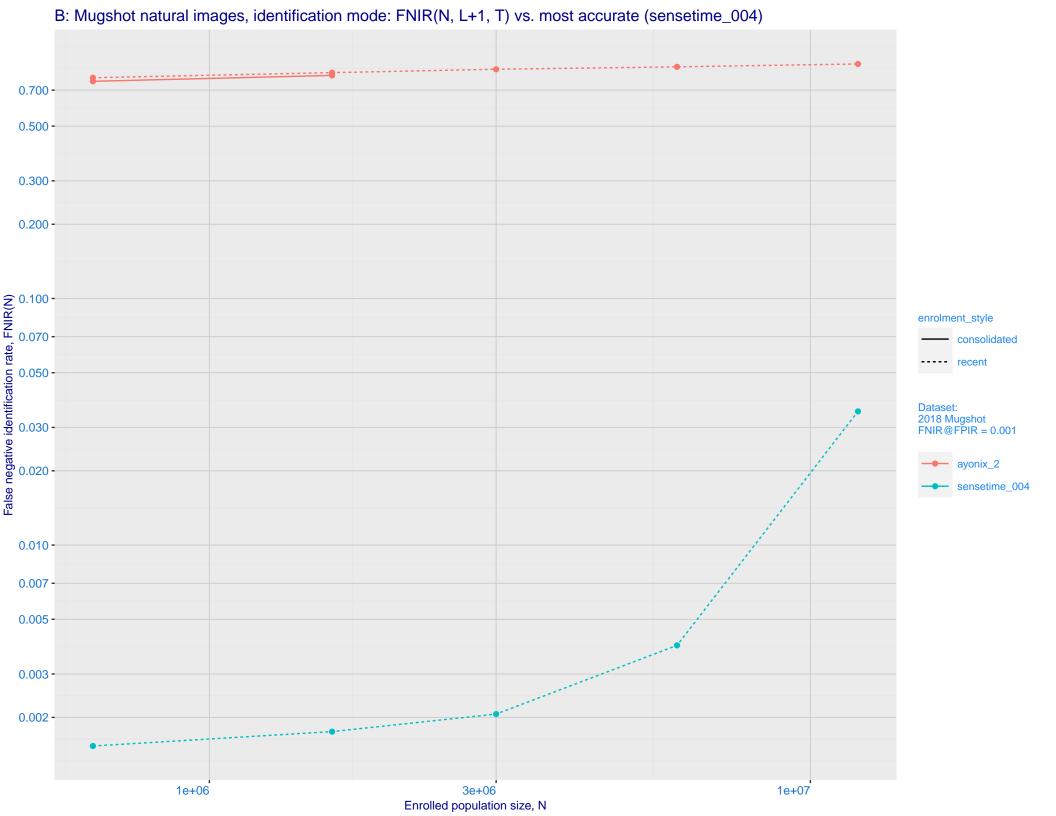
Frontal mugshot ranking 258 (out of 279) -- FNIR(1600000, T, L+1) = 0.8241, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

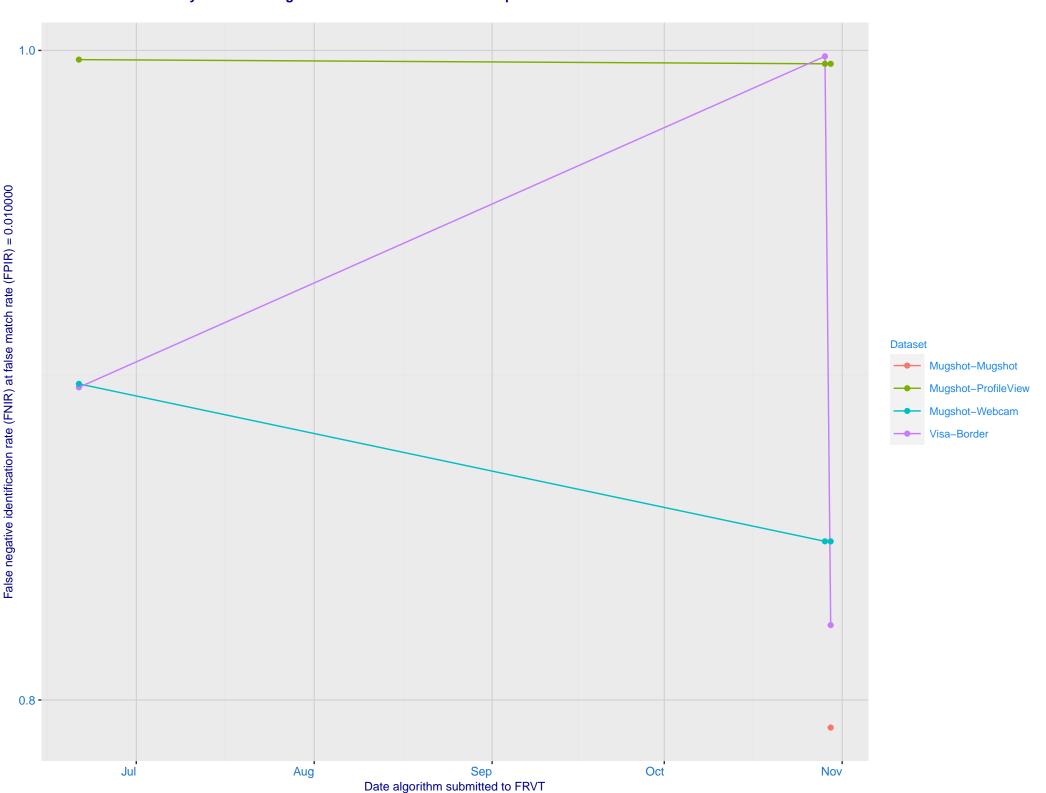
Mugshot webcam ranking 220 (out of 236) -- FNIR(1600000, T, L+1) = 0.9201, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 152 (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 144 (out of 167) -- FNIR(1600000, T, L+1) = 0.9151, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 128 (out of 162) -- FNIR(1600000, T, L+1) = 0.9691, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

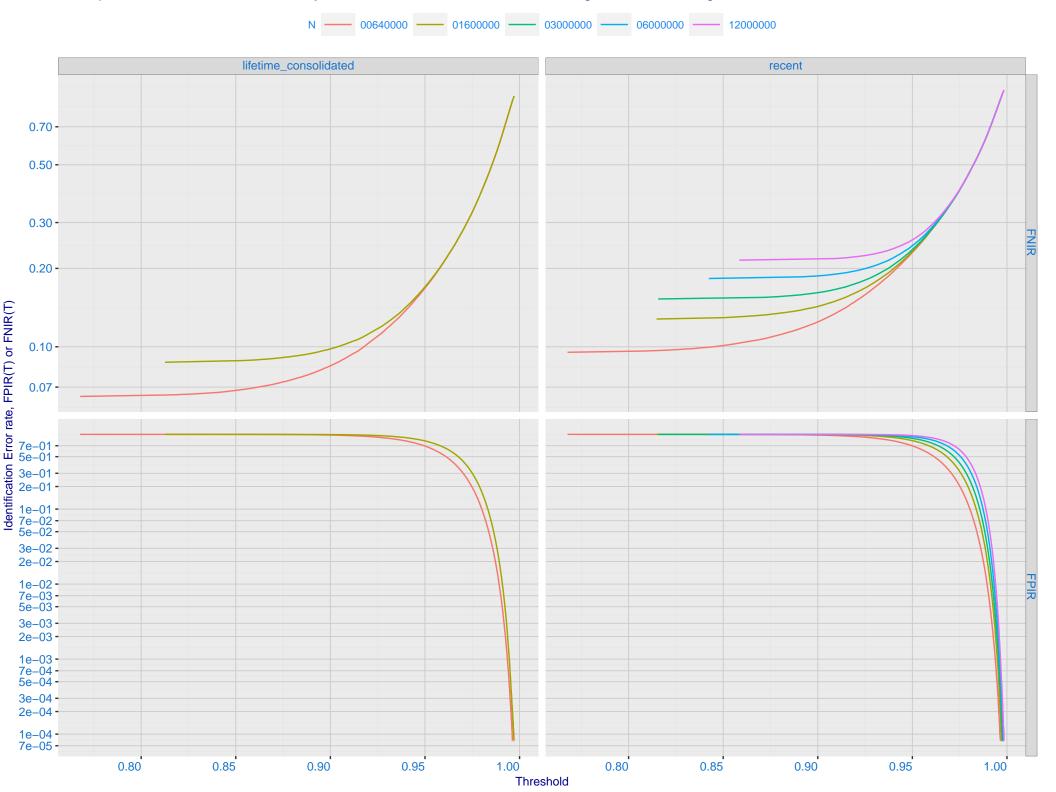




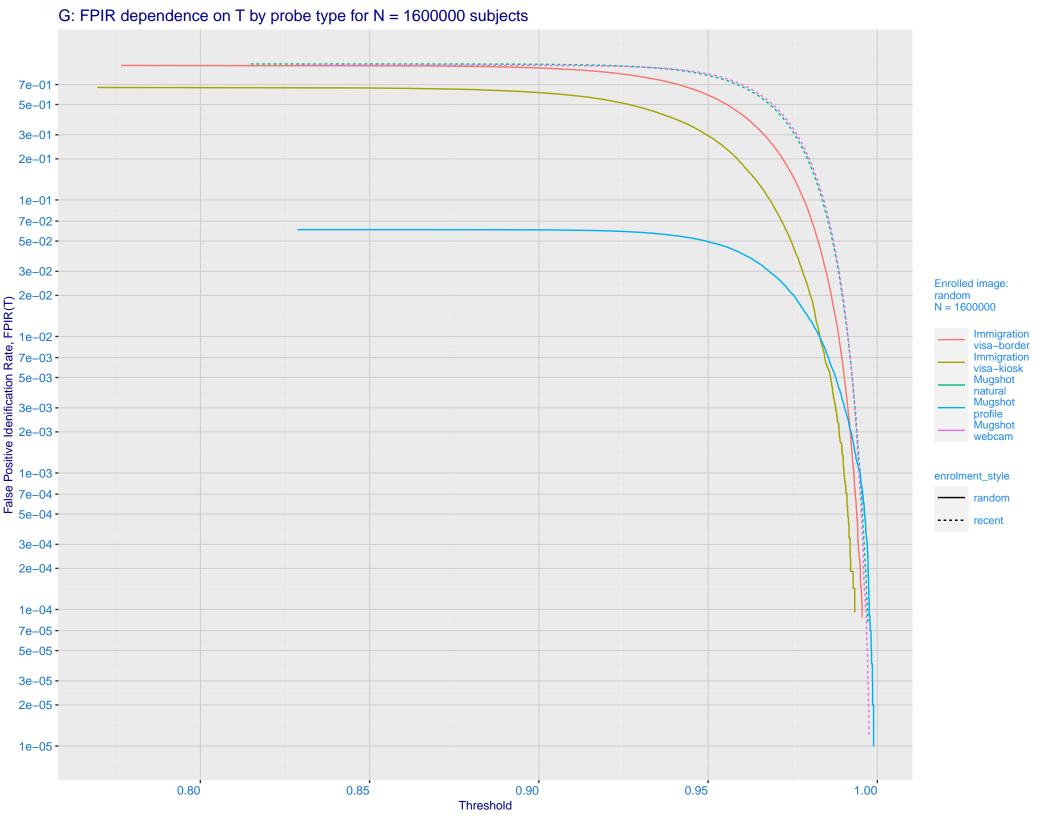
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 - 0.005 - 0.005 - 0.002 - 0.001 - 0.001 - 0.500 - 0.200 enrolment_style consolidated-ONE-MATE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

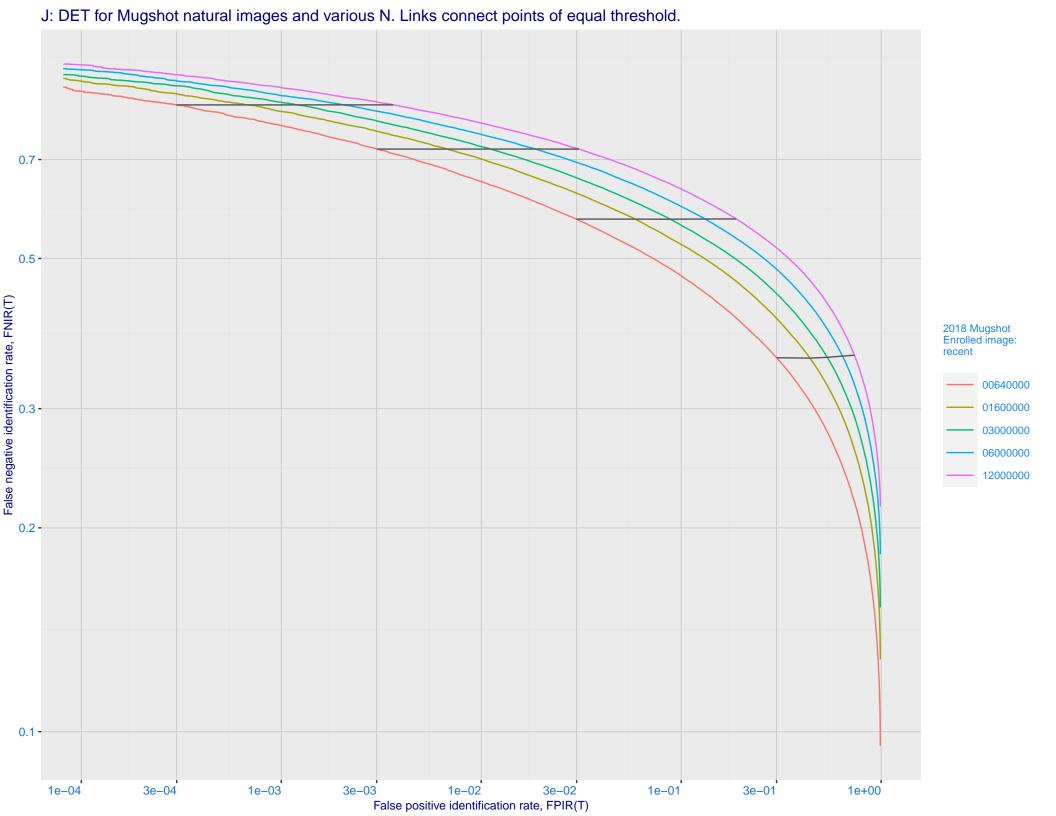
False positive identification rate, FPIR(T)

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

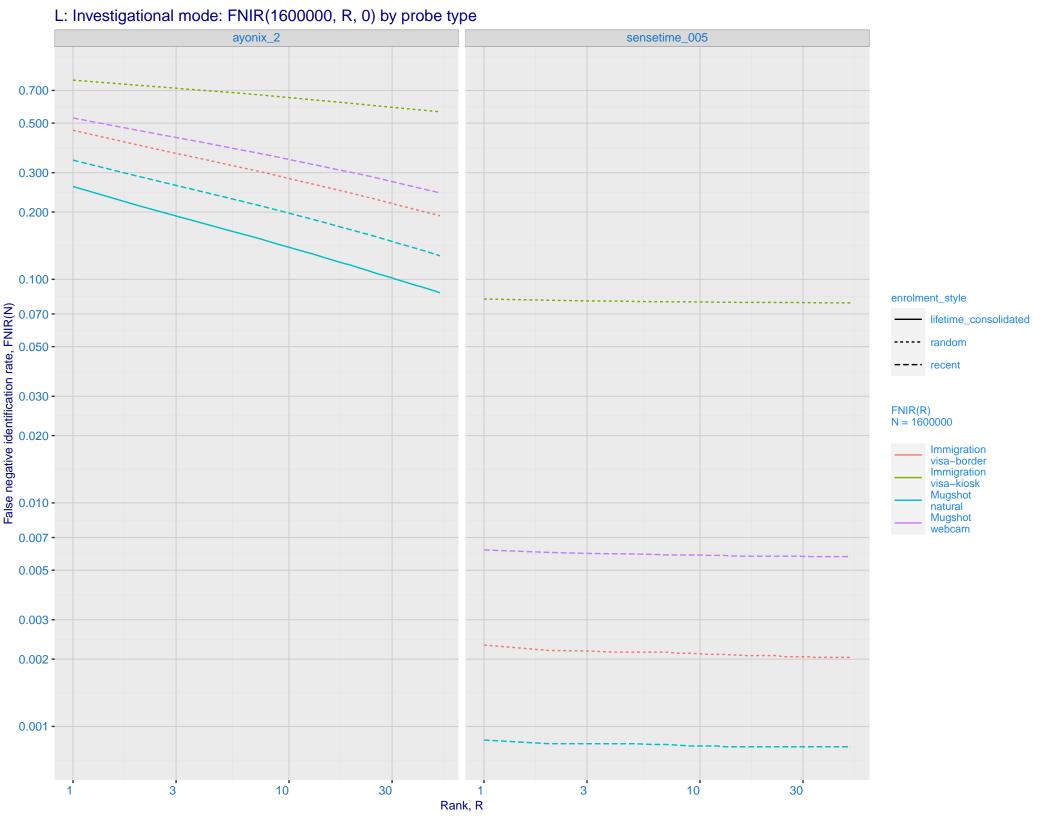


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 - 5e-02 - 3e-02 - 2e-02 - 1e-02 - 7-00 **Enrolled images:** recent N = 1600000 Mugshot natural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



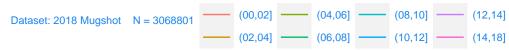


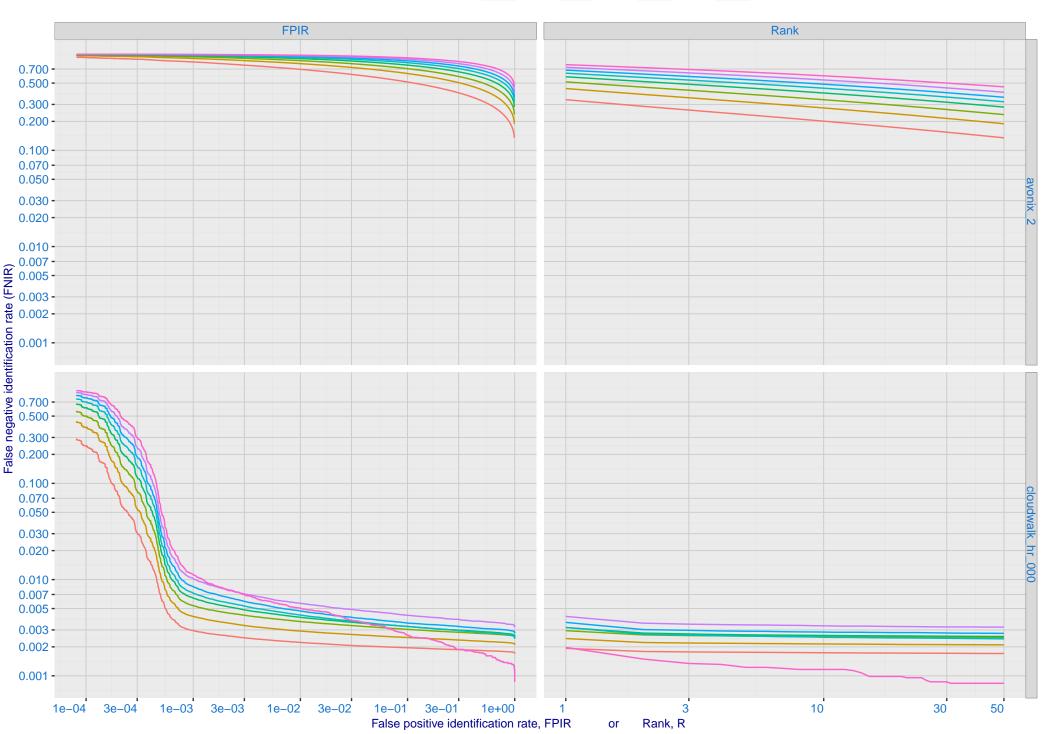
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 - 0.003 - 0.002 - 0.001 - 0.001 - 0.700 - 0.500 - 0.200 enrolment_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 ayonix_2 sensetime_005 0.100 -0.070 -0.050 -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 3000 -Log Model ---- Power Law Model 2000 -1000 -700 -500 -300 -Search Duration (milliseconds) 200 -100 -70 -50 -30 -20 -10-1e+06 3e+06 1e+07 Enrolled population size, N, one image per person

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 = 3.1MColor encodes FNIR (Rank = 1) 0.20 0.9 -0.15 0.10 0.05 0.00 **TVAL** 0.8 -- FPIR = 0.001 FPIR = 0.003 FPIR = 0.010FPIR = 0.030 0.7 -(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)