A: Datasheet

Algorithm: visionlabs_6

Developer: VisionLabs

Submission Date: 2018_10_30

Template size: 512 bytes

Template time (2.5 percentile): 289 msec

Template time (median): 289 msec

Template time (97.5 percentile): 308 msec

Investigation:

Frontal mugshot ranking 27 (out of 279) -- FNIR(1600000, 0, 1) = 0.0018 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 54 (out of 241) -- FNIR(1600000, 0, 1) = 0.0150 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 25 (out of 210) — FNIR(1600000, 0, 1) = 0.2114 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 28 (out of 168) — FNIR(1600000, 0, 1) = 0.0038 vs. lowest 0.0013 from visionlabs_010

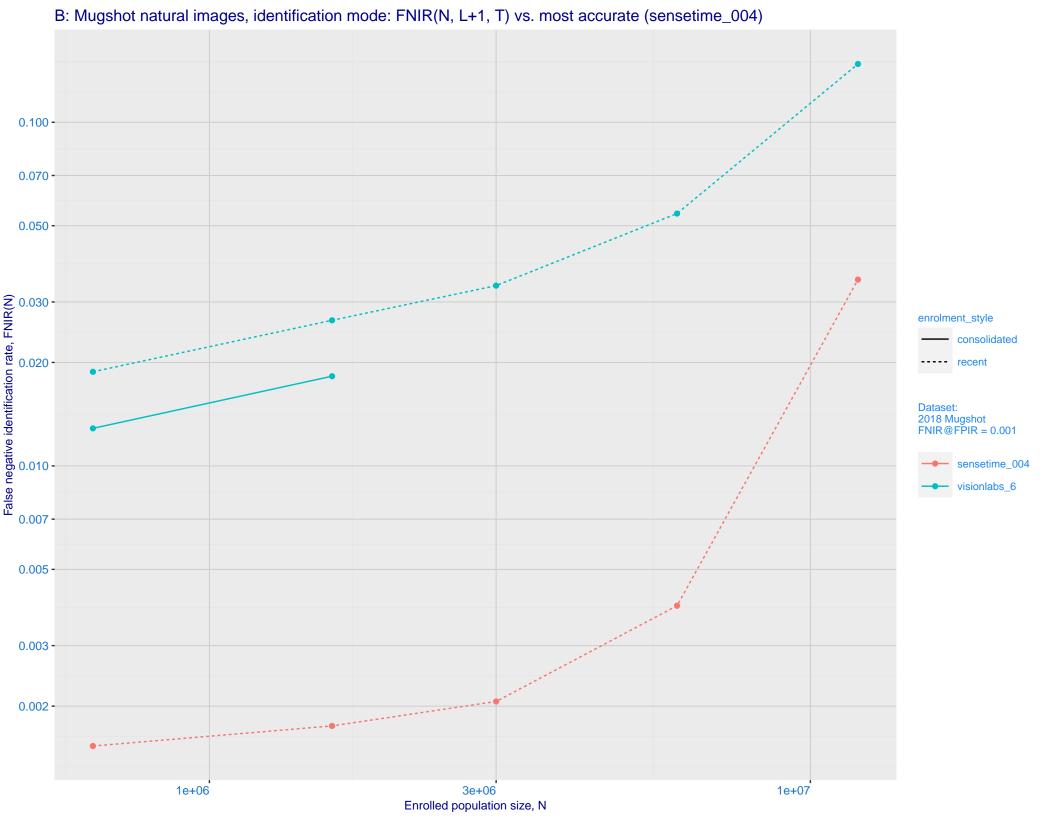
Immigration visa-kiosk ranking 27 (out of 165) -- FNIR(1600000, 0, 1) = 0.0957 vs. lowest 0.0568 from cloudwalk_hr_000

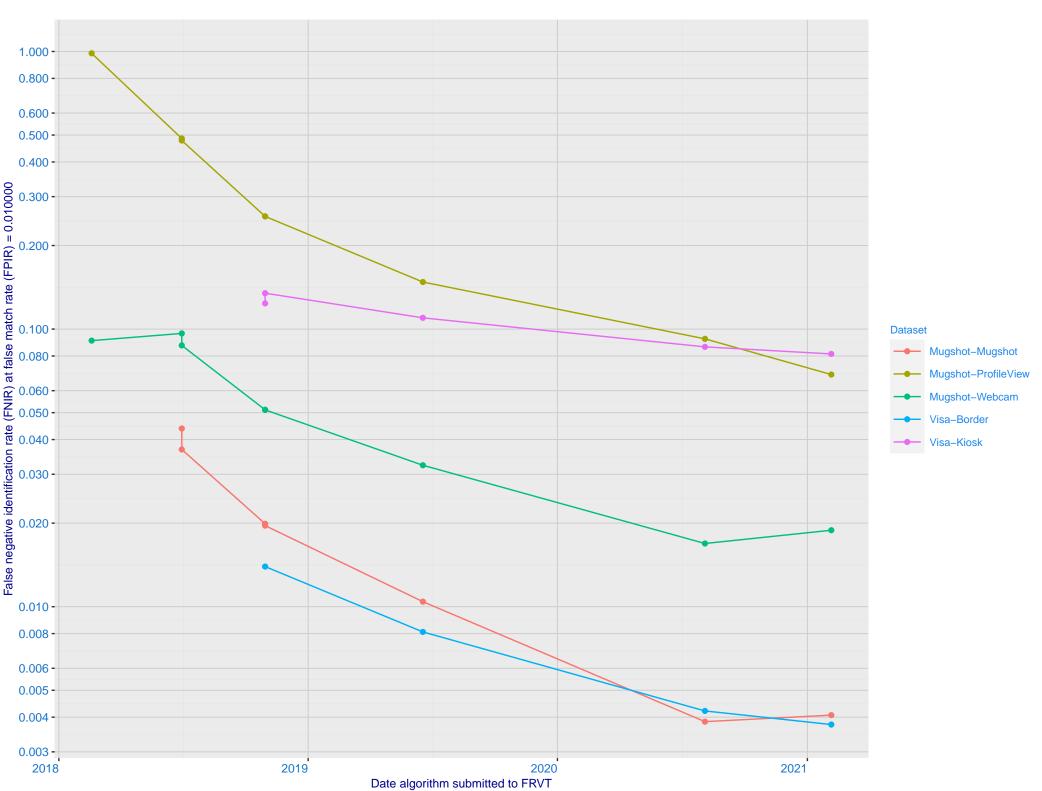
Identification:

Frontal mugshot ranking 54 (out of 279) -- FNIR(1600000, T, L+1) = 0.0265, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 63 (out of 236) -- FNIR(1600000, T, L+1) = 0.0902, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 17 (out of 209) -- FNIR(1600000, T, L+1) = 0.6723, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

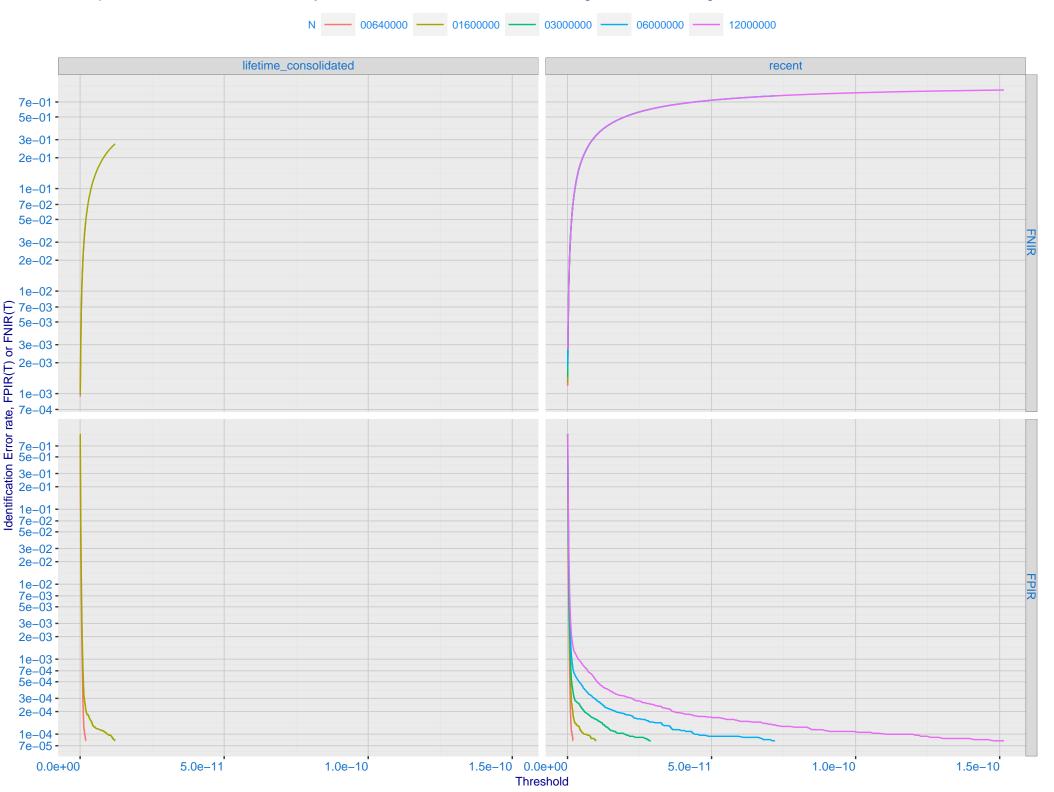




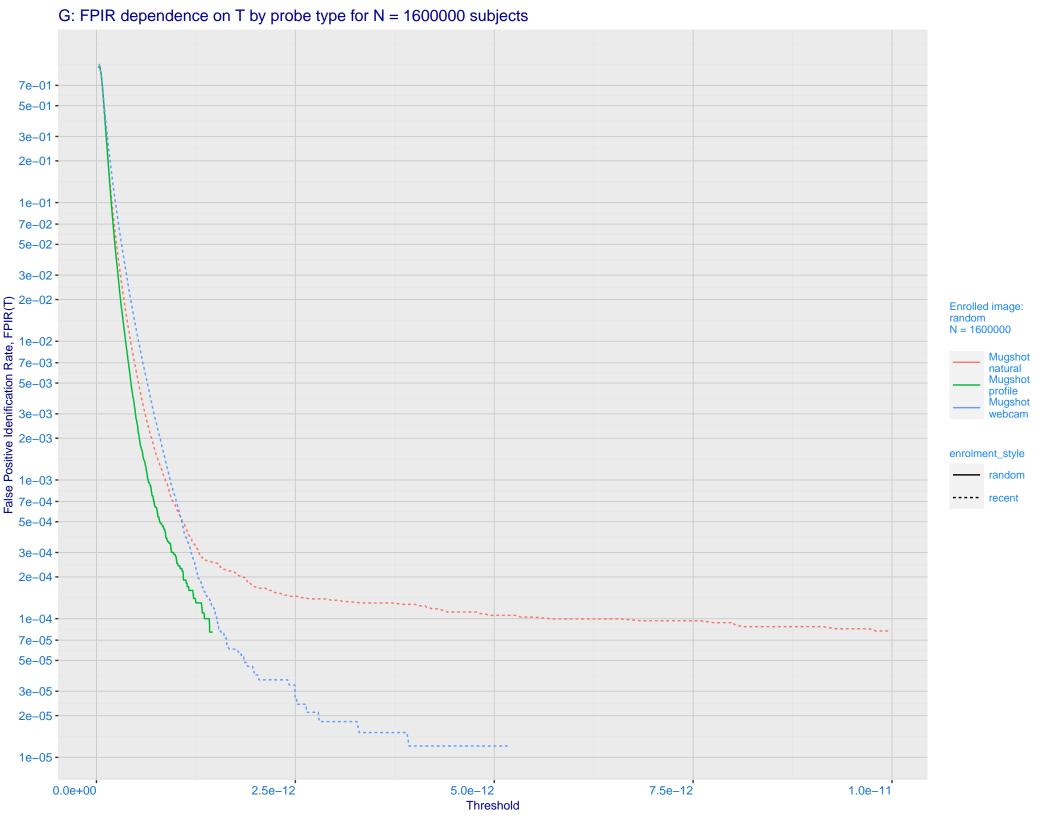
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 sensetime 004 0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.000 - 0.500 - 0.500 - 0.200 - 0.100 - 0. enrolment_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.070 -0.050 visionlabs 6 0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

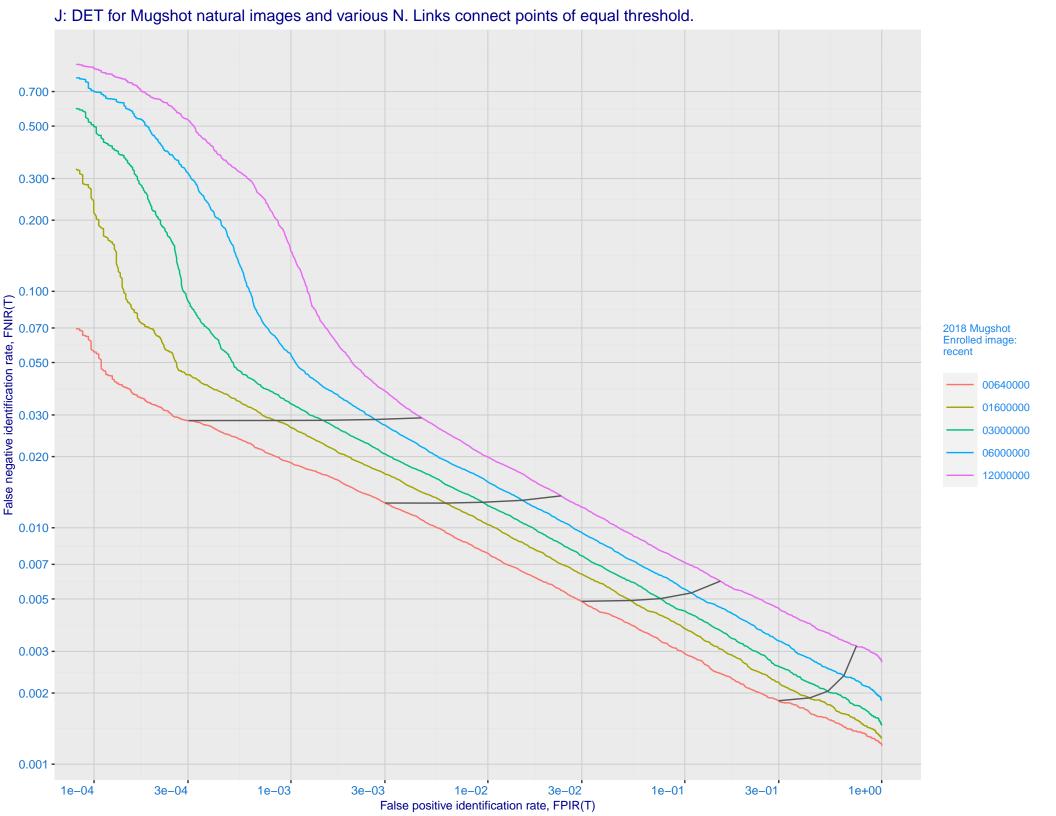
False positive identification rate, FPIR(T)

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

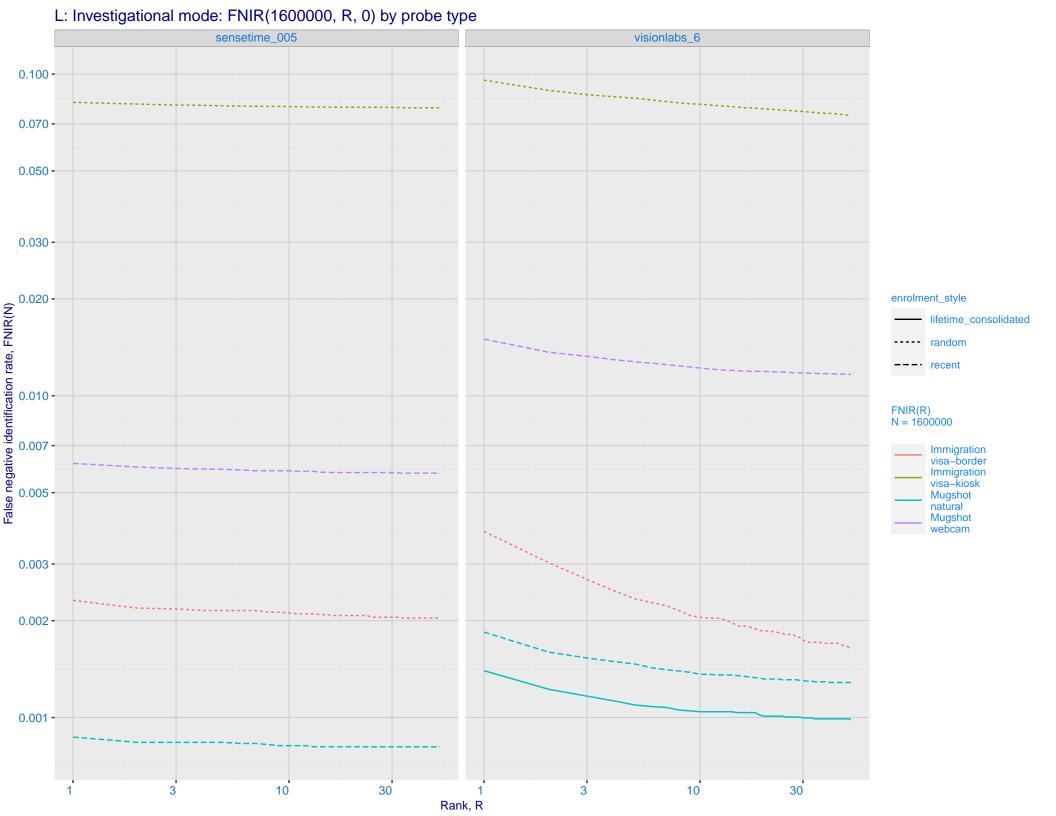


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 · 2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam 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 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0. enrolment_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 sensetime_005 visionlabs_6 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

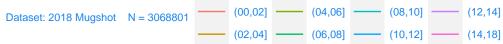


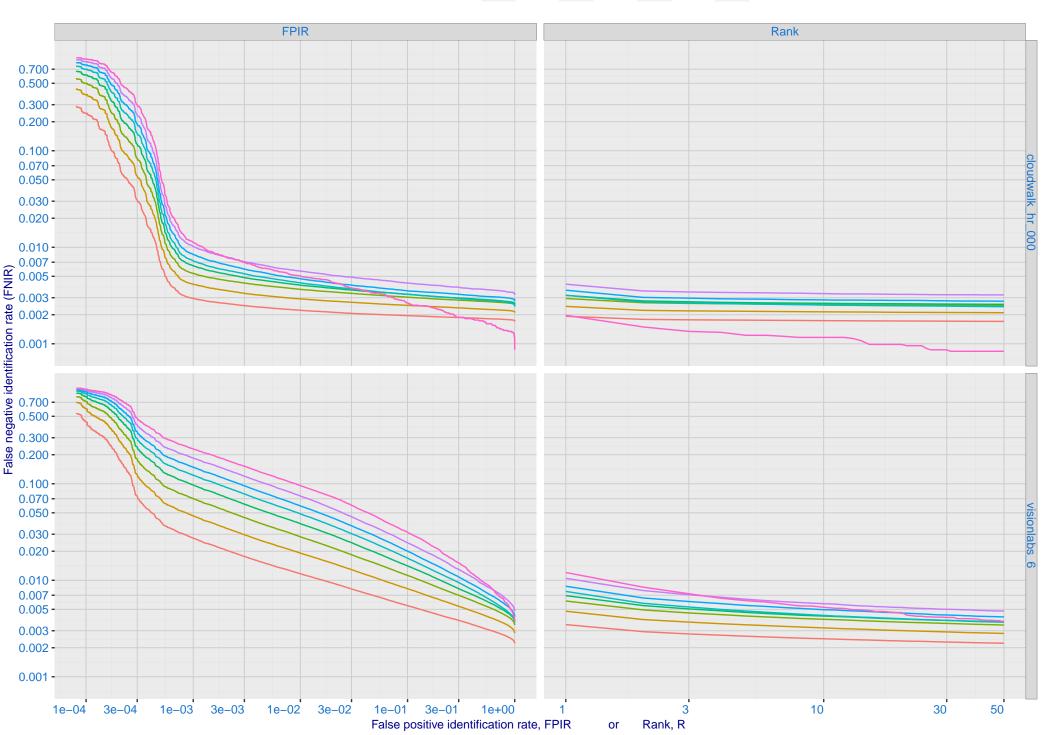
M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations Log Model ---- Power Law Model 300 -200 -100 -70 -50 -30 -20 -1e+06 3e+06 1e+07

Enrolled population size, N, one image per person

Search Duration (milliseconds)

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 Dataset: 2018 Mugshot N = 3.1M1e-07 -Color encodes FNIR (Rank = 1) 0.20 0.15 0.10 0.05 0.00 **TVAL** 5e-08 -- FPIR = 0.001 FPIR = 0.003 FPIR = 0.010FPIR = 0.030 0e+00 -(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)