A: Datasheet

Algorithm: aware_6

Developer: Aware

Submission Date: 2018_10_30

Template size: 124 bytes

Template time (2.5 percentile): 764 msec

Template time (median): 789 msec

Template time (97.5 percentile): 1280 msec

Investigation:

Frontal mugshot ranking 226 (out of 279) -- FNIR(1600000, 0, 1) = 0.0697 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 196 (out of 241) -- FNIR(1600000, 0, 1) = 0.1283 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 197 (out of 210) — FNIR(1600000, 0, 1) = 0.9832 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 122 (out of 168) -- FNIR(1600000, 0, 1) = 0.1111 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 131 (out of 165) -- FNIR(1600000, 0, 1) = 0.4208 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

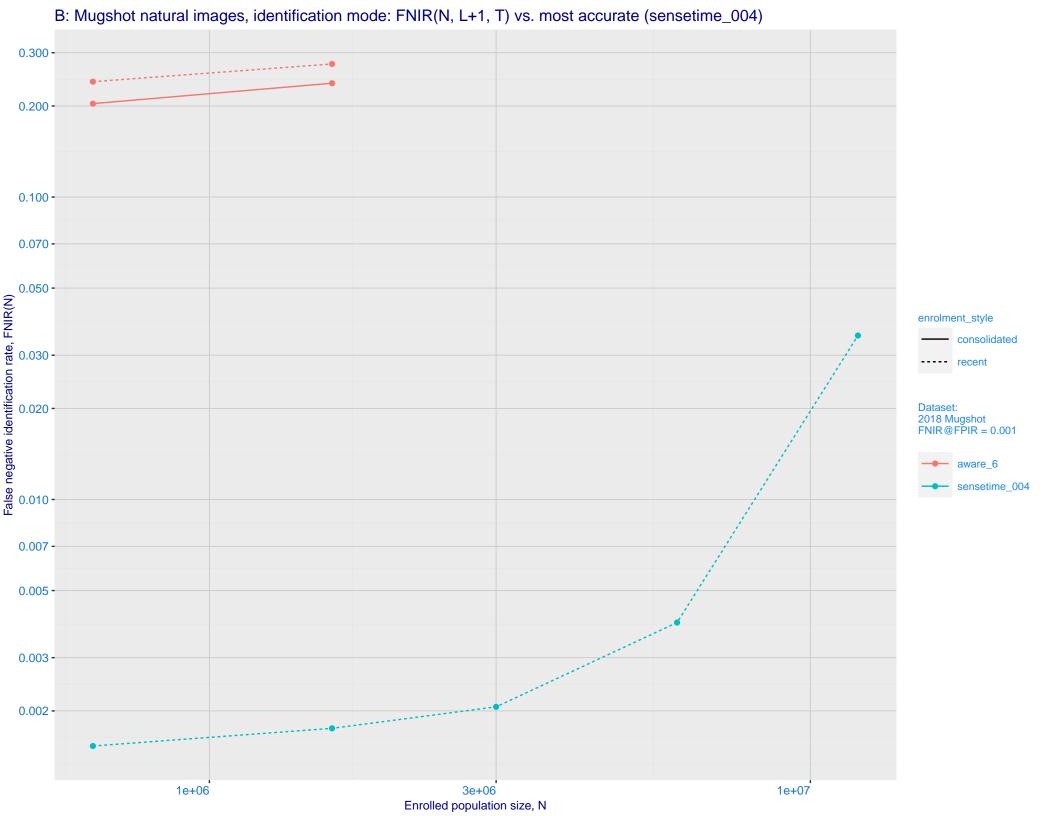
Frontal mugshot ranking 203 (out of 279) -- FNIR(1600000, T, L+1) = 0.2754, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 182 (out of 236) -- FNIR(1600000, T, L+1) = 0.3983, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

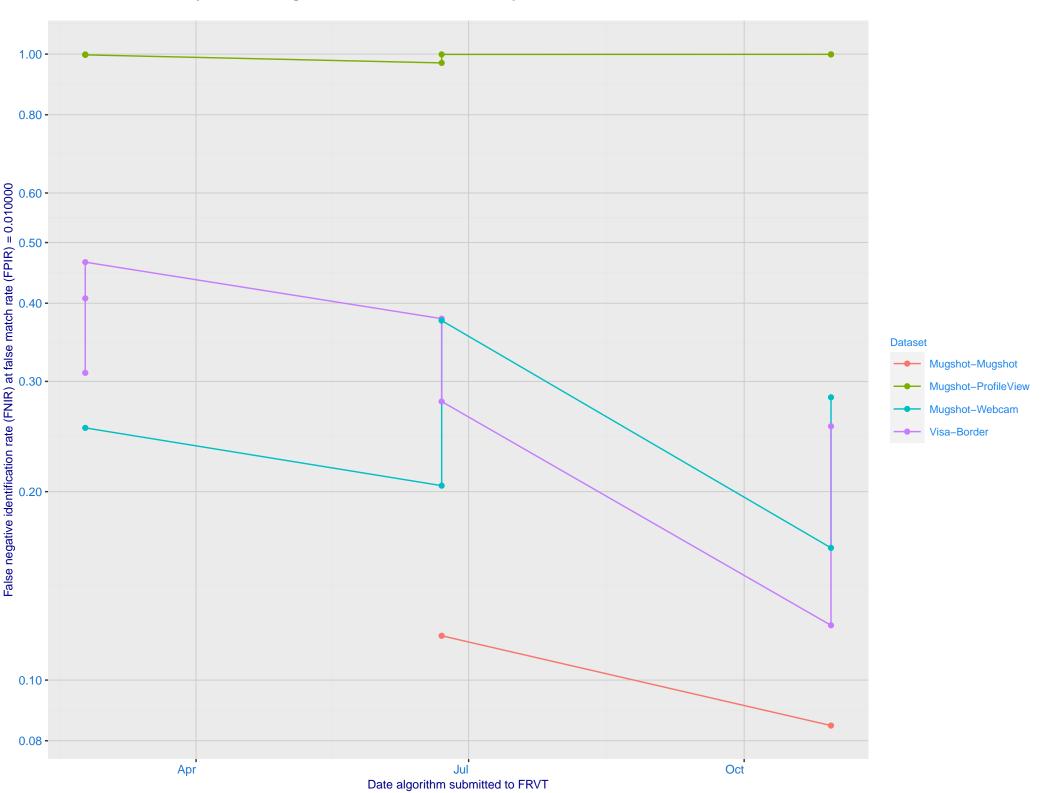
Mugshot profile ranking 154 (out of 209) -- FNIR(1600000, T, L+1) = 0.9994, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 111 (out of 167) -- FNIR(1600000, T, L+1) = 0.3680, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 94 (out of 162) -- FNIR(1600000, T, L+1) = 0.7488, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000



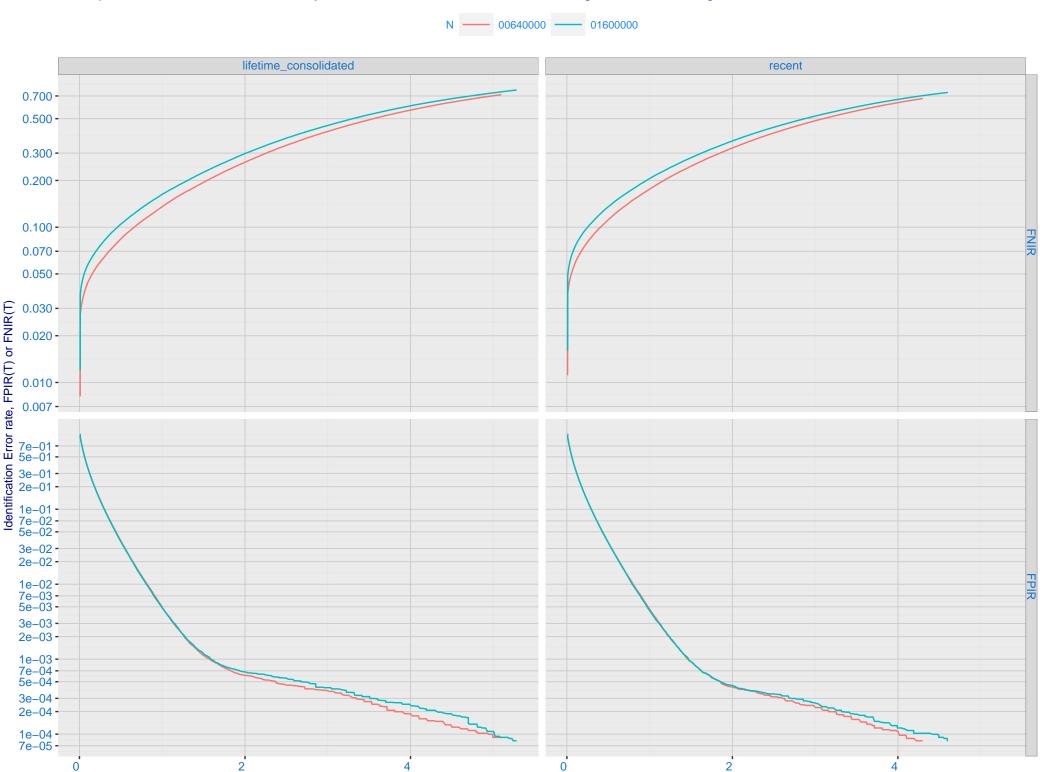
C: Evolution of accuracy for AWARE algorithms on three datasets 2018 – present



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 aware 6 0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.002 - 0.001 - 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 -

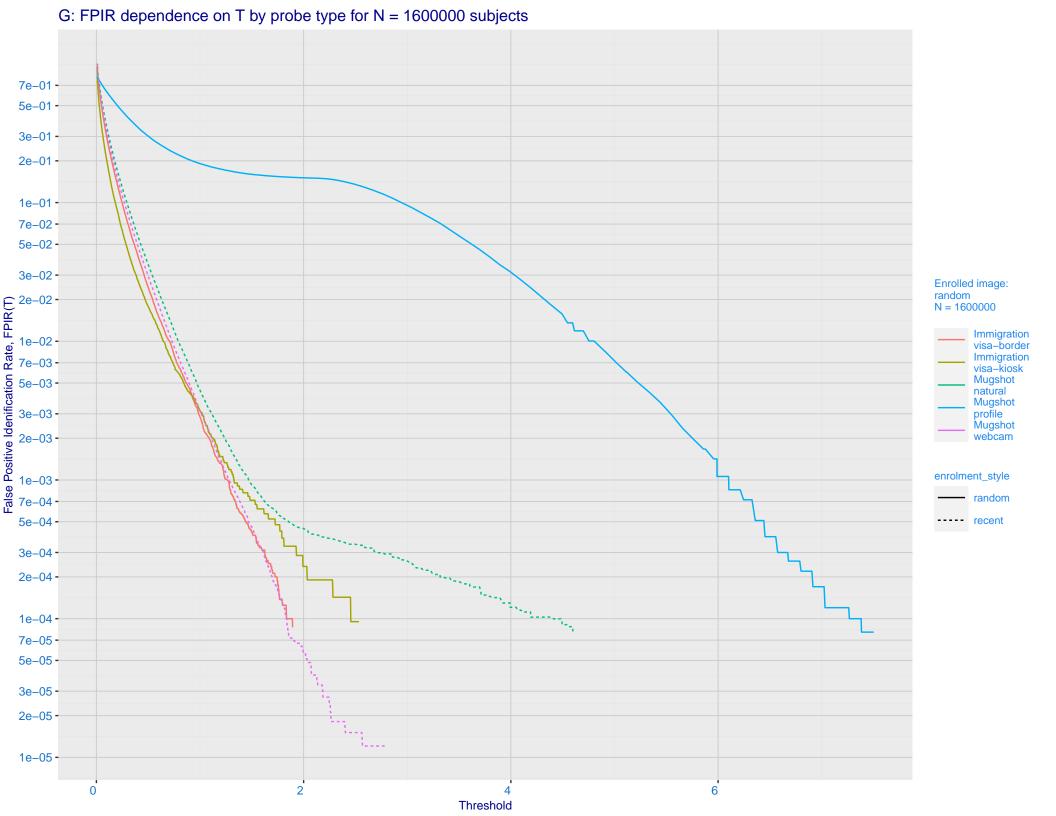
False positive identification rate, FPIR(T)

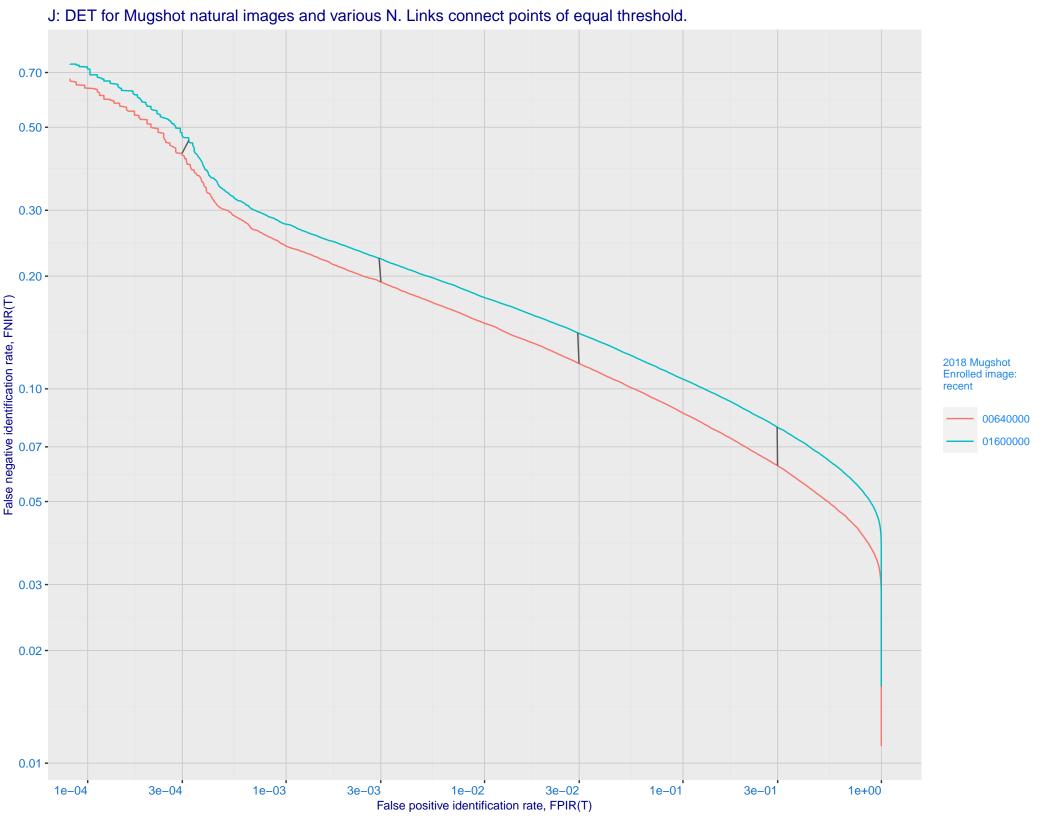
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



Threshold

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)

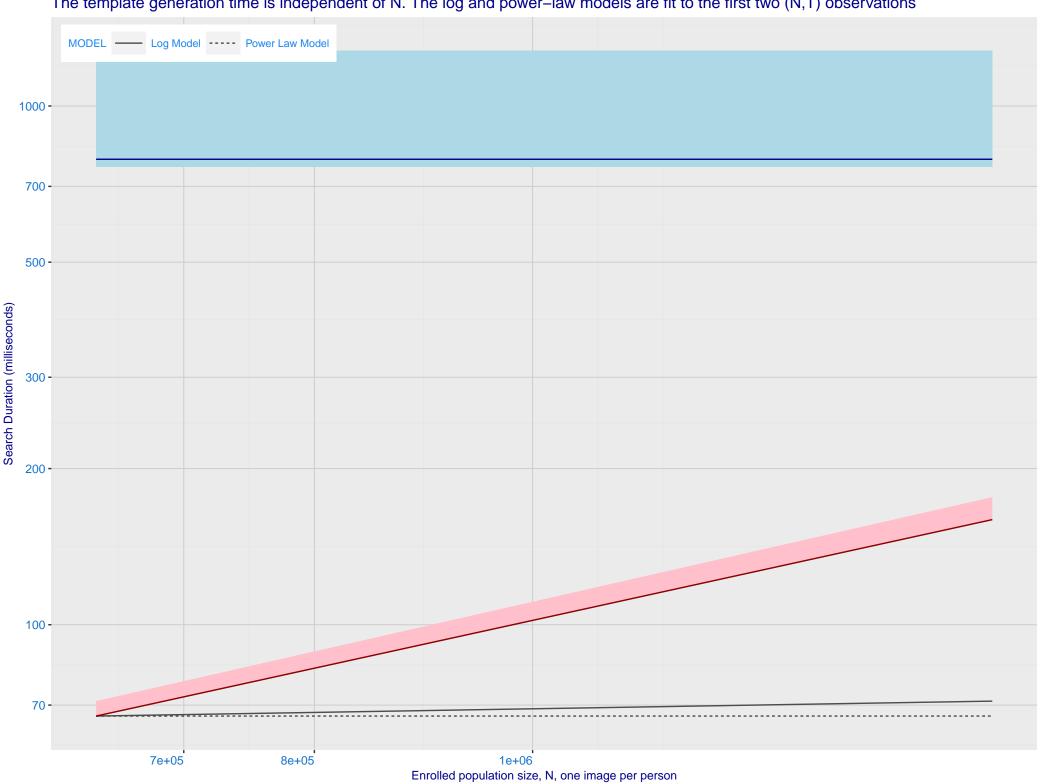




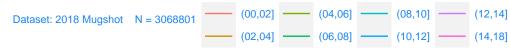
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.500 -• 0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Ealse negative identification rate, FNIR(N) 0.003 - 0.001 - 0.500 - 0.200 - 0.100 - 0. FNIR@Rank = 1 aware_6 sensetime_005 Mugshot Mugshot webcam natural enrolment_style consolidated ---- random --- recent 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

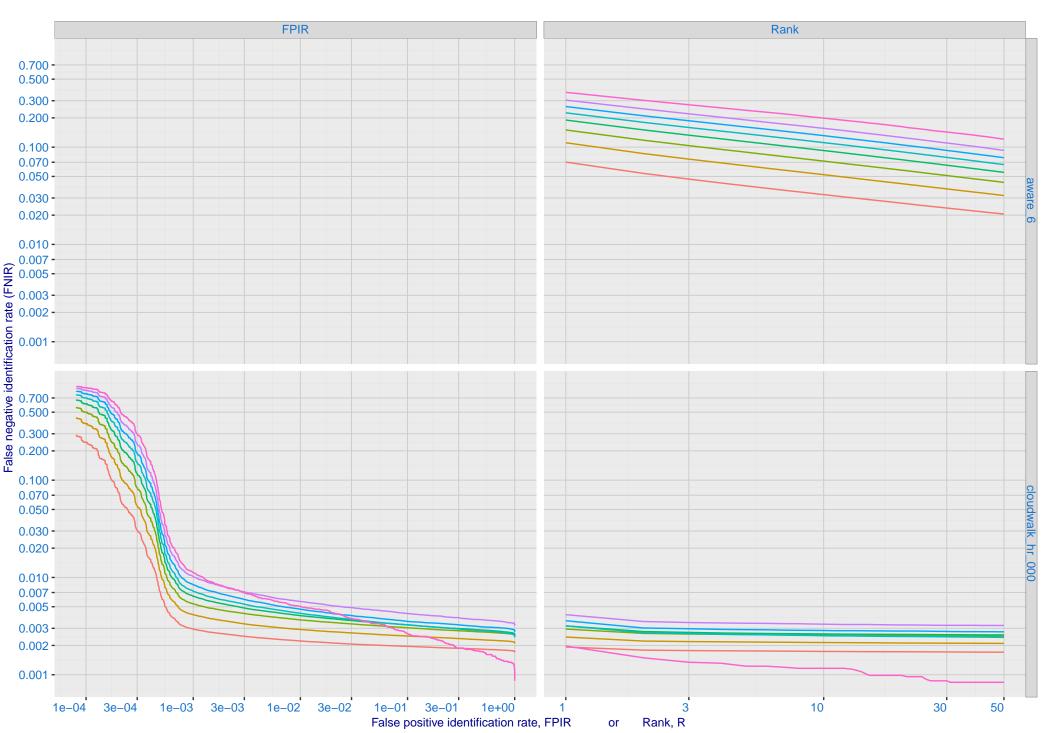
L: Investigational mode: FNIR(1600000, R, 0) by probe type aware_6 sensetime_005 0.500 -0.300 -0.200 -0.100 -0.070 enrolment_style False negative identification rate, FNIR(N) - 0.000 - lifetime_consolidated ---- random --- recent FNIR(R) N = 1600000 Immigration visa-border Immigration visa-kiosk Mugshot natural Mugshot webcam 0.005 -0.003 -0.002 -0.001 -10 30 3 10 30 Rank, R

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 Dataset: 2018 Mugshot N= 3.1M Color encodes FNIR (Rank = 1) 20 -0.15 0.10 0.05 0.00 **TVAL** 10 -- FPIR = 0.001 FPIR = 0.003 FPIR = 0.010FPIR = 0.030 (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)