A: Datasheet

Algorithm: xforwardai_001

Developer: Xforward Al Technology

Submission Date: 2021_01_21

Template size: 2048 bytes

Template time (2.5 percentile): 676 msec

Template time (median): 677 msec

Template time (97.5 percentile): 696 msec

Investigation:

Frontal mugshot ranking 33 (out of 265) -- FNIR(1600000, 0, 1) = 0.0020 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 30 (out of 227) -- FNIR(1600000, 0, 1) = 0.0125 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 4 (out of 196) — FNIR(1600000, 0, 1) = 0.0667 vs. lowest 0.0591 from sensetime_005

Immigration visa-border ranking 15 (out of 148) -- FNIR(1600000, 0, 1) = 0.0028 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 11 (out of 145) -- FNIR(1600000, 0, 1) = 0.0819 vs. lowest 0.0568 from hr_000

Identification:

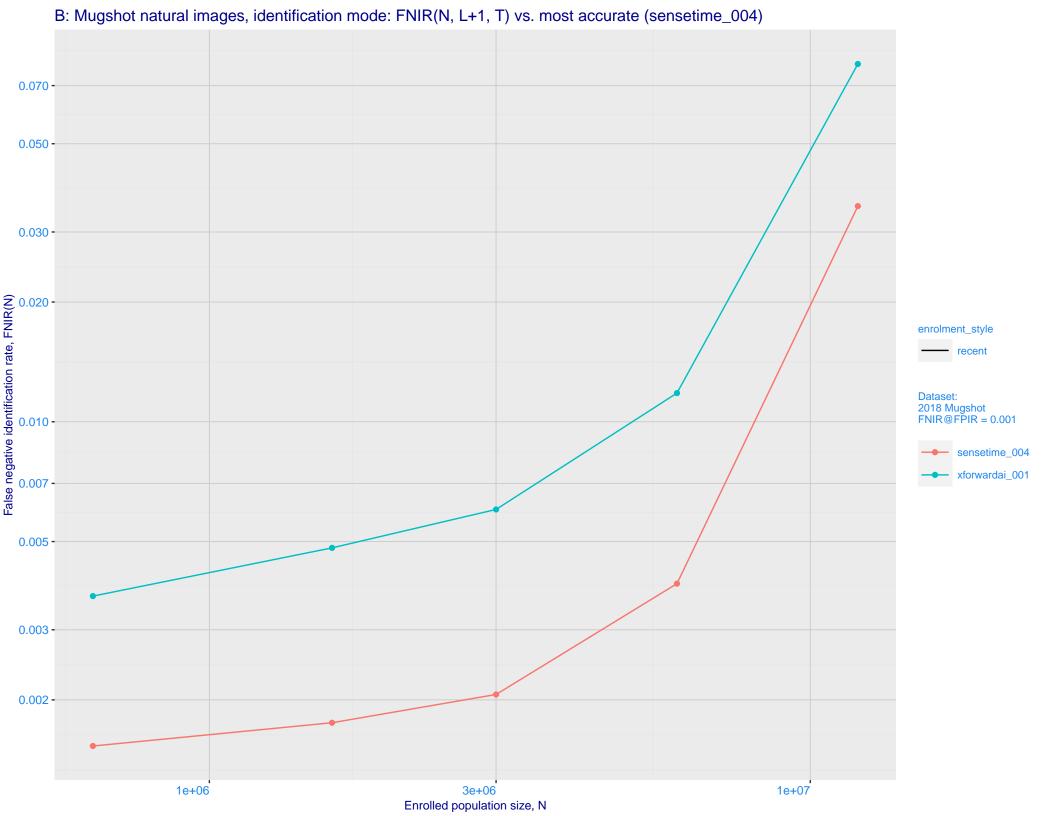
Frontal mugshot ranking 11 (out of 265) -- FNIR(1600000, T, L+1) = 0.0048, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 15 (out of 225) -- FNIR(1600000, T, L+1) = 0.0282, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

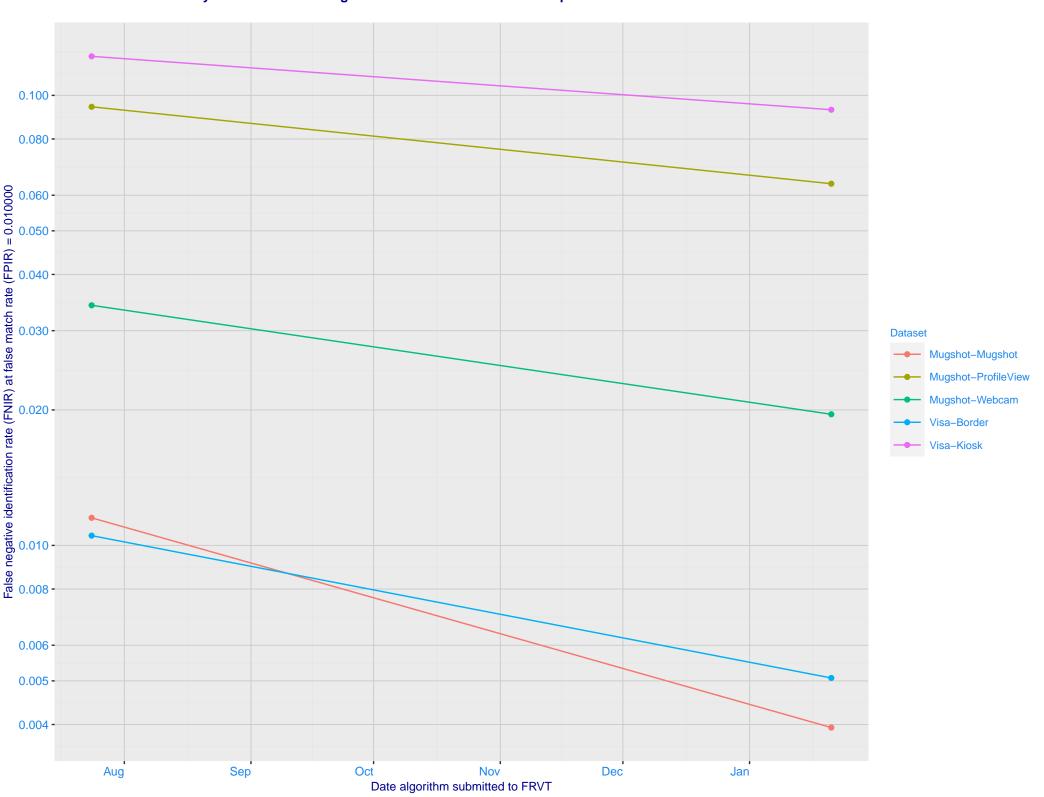
Mugshot profile ranking 7 (out of 195) -- FNIR(1600000, T, L+1) = 0.4479, FPIR=0.001000 vs. lowest 0.1331 from hr_000

Immigration visa-border ranking 8 (out of 146) -- FNIR(1600000, T, L+1) = 0.0080, FPIR=0.001000 vs. lowest 0.0049 from hr_000

Immigration visa-kiosk ranking 6 (out of 141) -- FNIR(1600000, T, L+1) = 0.1241, FPIR=0.001000 vs. lowest 0.0996 from hr_000



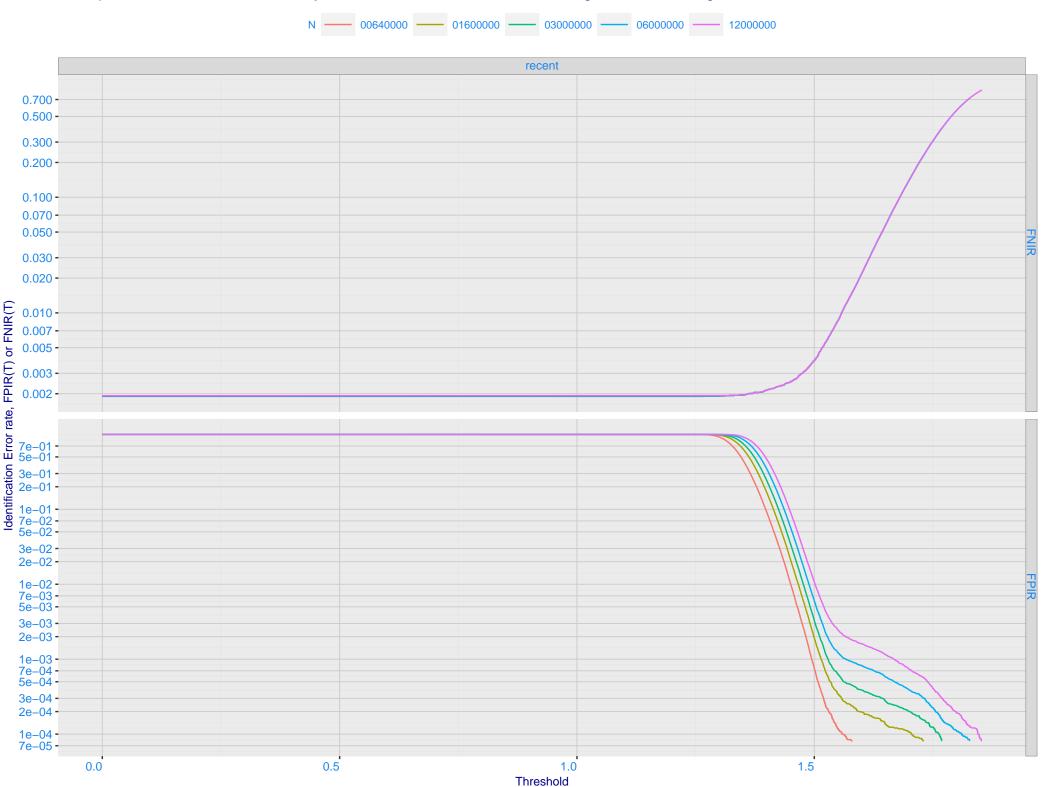
C: Evolution of accuracy for XFORWARDAI algorithms on three datasets 2018 – present



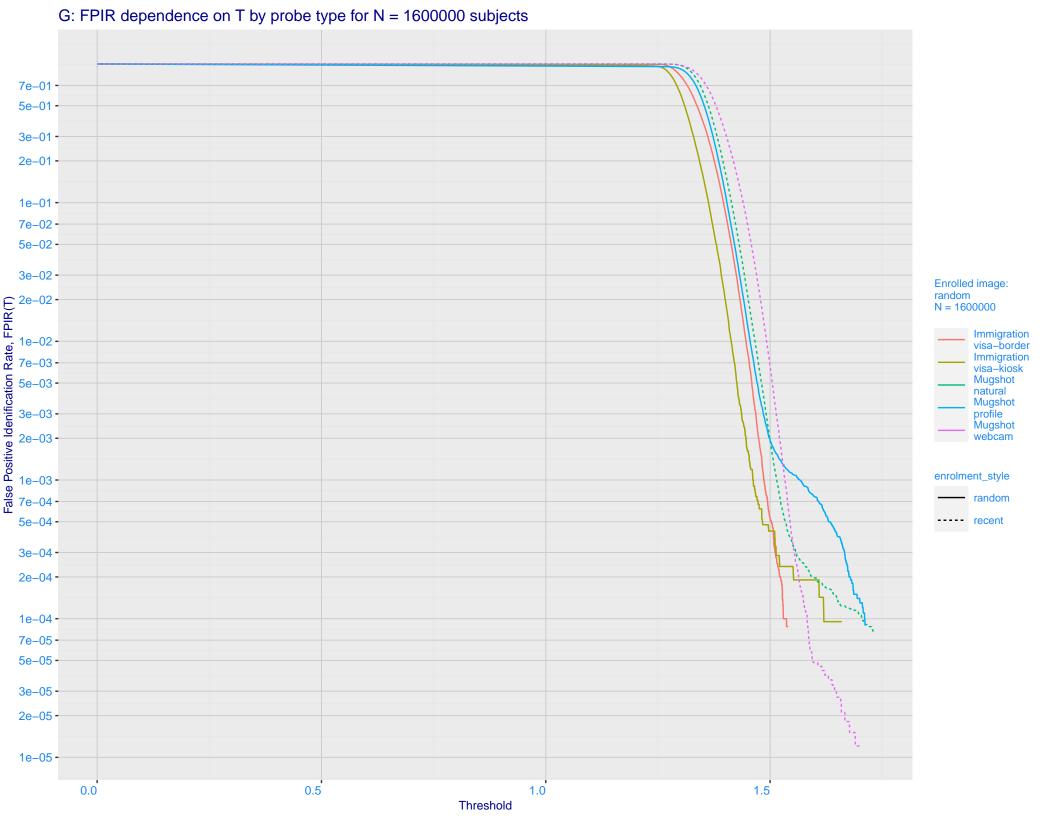
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration Immigration Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.0001 - 0.700 - 0.500 - 0.200 - 0.100 - 0 enrolment_style random-ONE-MATE recent-ONE-MATE 0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 - $1e^{-0.4}e^{-0.3}e^{-0.4}e^{-0.3}e^{-0.3}e^{-0.3}e^{-0.3}e^{-0.3}e^{-0.3}e^{-0.1}e^{-0.3}e^{-0.1}e^{-0.3}e^{-0.4}e^{-0.3}e^{$

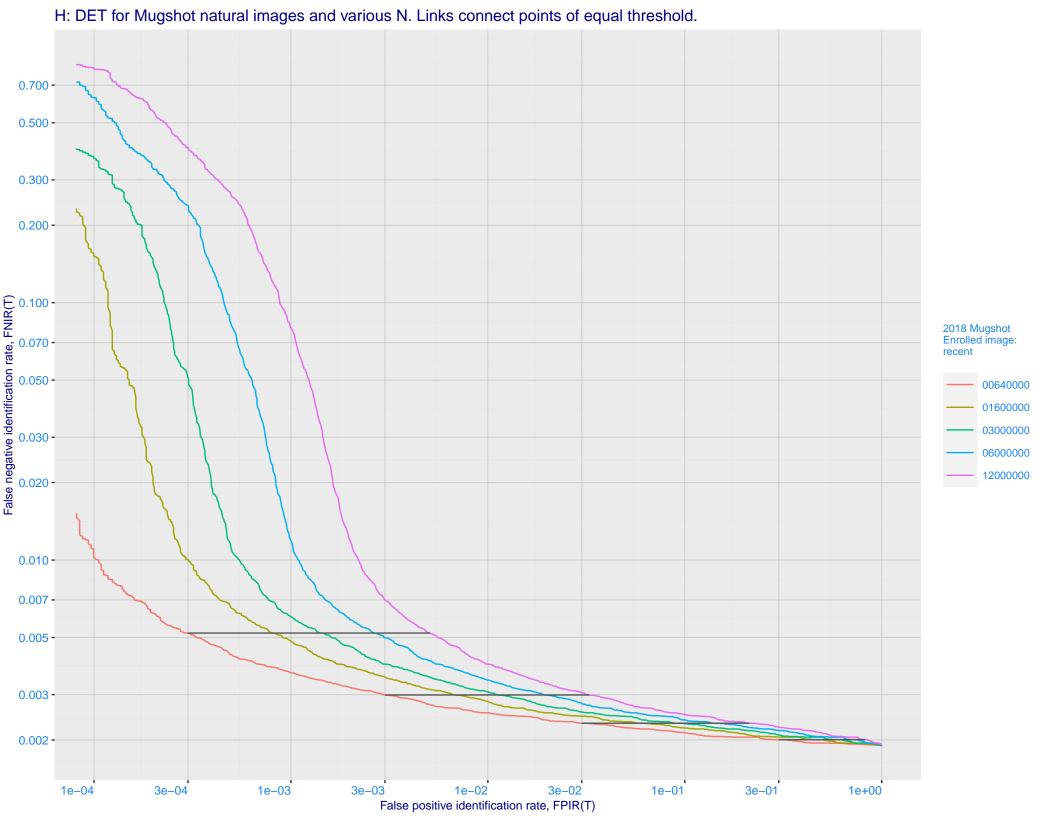
False positive identification rate, FPIR(T)

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

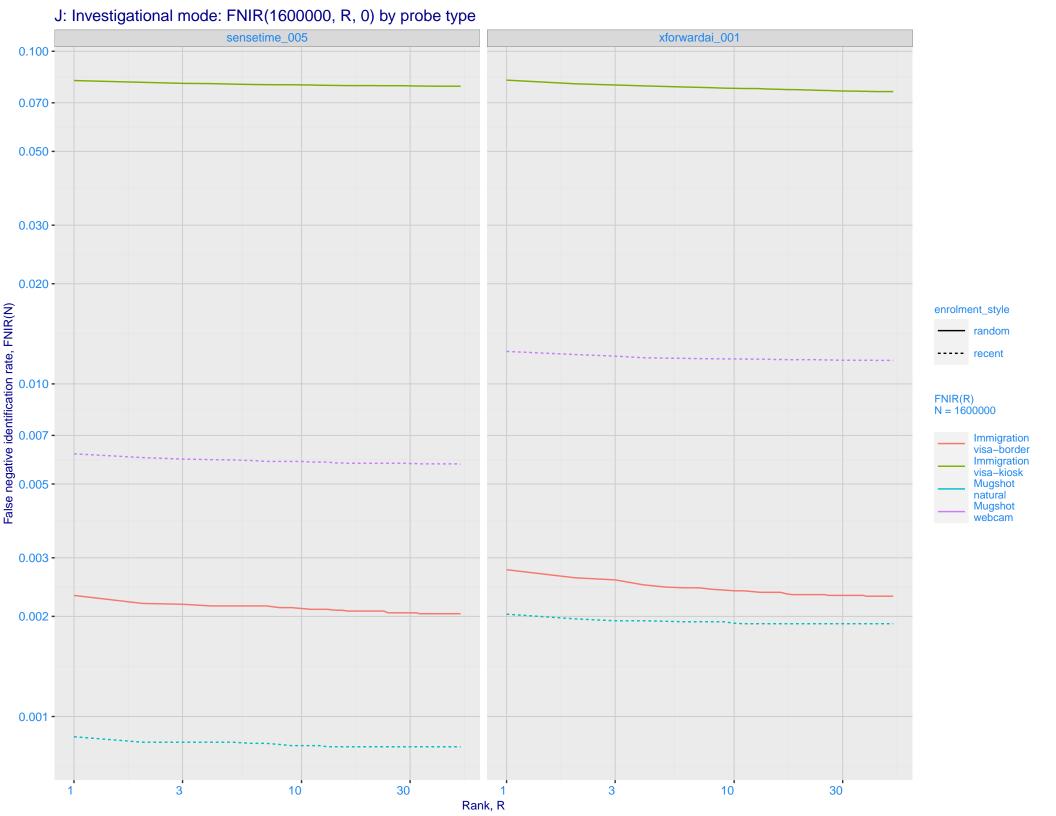


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

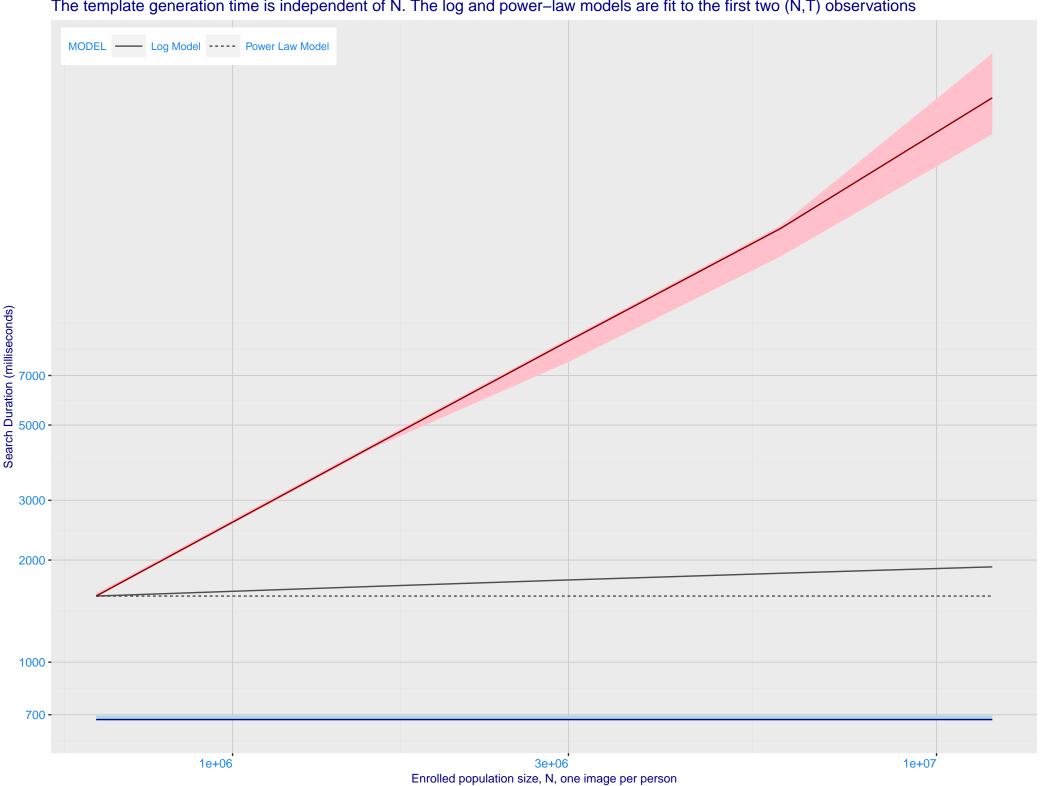




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.030 - 0. enrolment_style random ---- recent Mugshot Mugshot webcam natural FNIR@Rank = 1 sensetime_005 xforwardai_001 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



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



M: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing

