A: Datasheet

Algorithm: pixelall_003

Developer: Guangzhou Pixel Solutions Co Ltd

Submission Date: 2019_11_05

Template size: 2560 bytes

Template time (2.5 percentile): 696 msec

Template time (median): 704 msec

Template time (97.5 percentile): 770 msec

Investigation:

Frontal mugshot ranking 30 (out of 259) -- FNIR(1600000, 0, 1) = 0.0021 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 33 (out of 221) -- FNIR(1600000, 0, 1) = 0.0140 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 44 (out of 190) -- FNIR(1600000, 0, 1) = 0.5155 vs. lowest 0.0591 from sensetime_005

Immigration visa-border ranking 38 (out of 142) -- FNIR(1600000, 0, 1) = 0.0062 vs. lowest 0.0014 from visionlabs_009

Immigration visa-kiosk ranking 58 (out of 139) -- FNIR(1600000, 0, 1) = 0.1505 vs. lowest 0.0694 from cib_000

Identification:

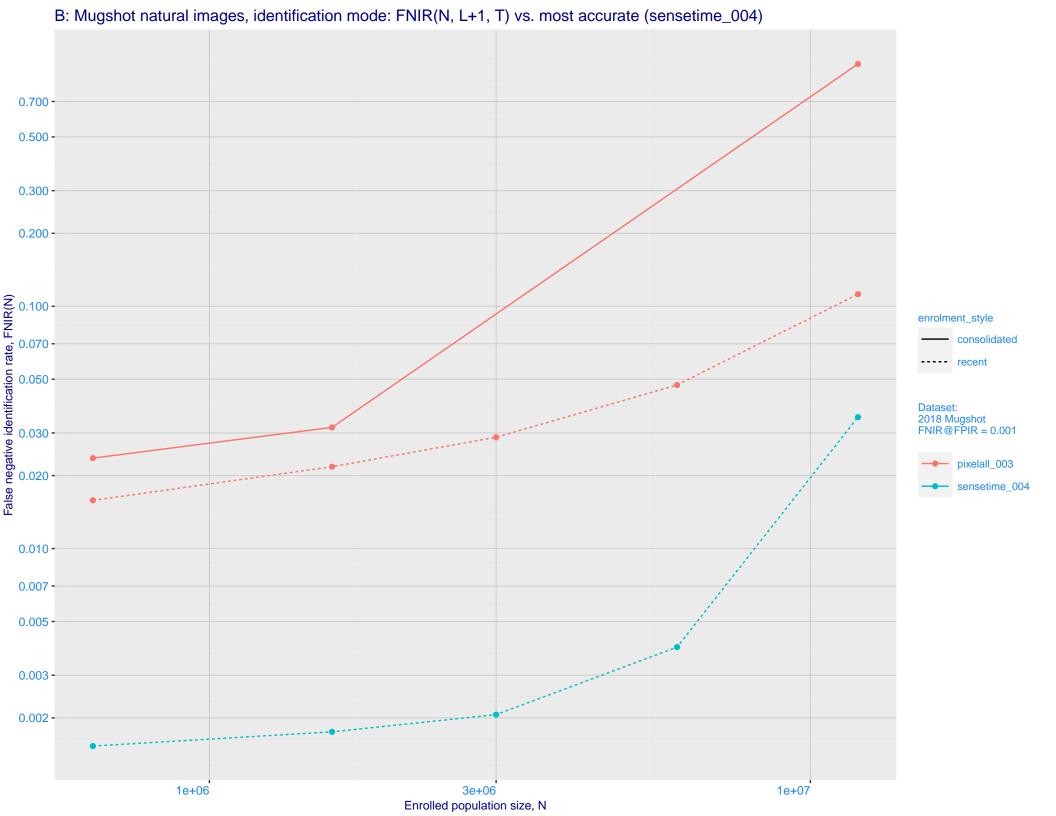
Frontal mugshot ranking 35 (out of 259) -- FNIR(1600000, T, L+1) = 0.0218, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 37 (out of 219) -- FNIR(1600000, T, L+1) = 0.0724, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

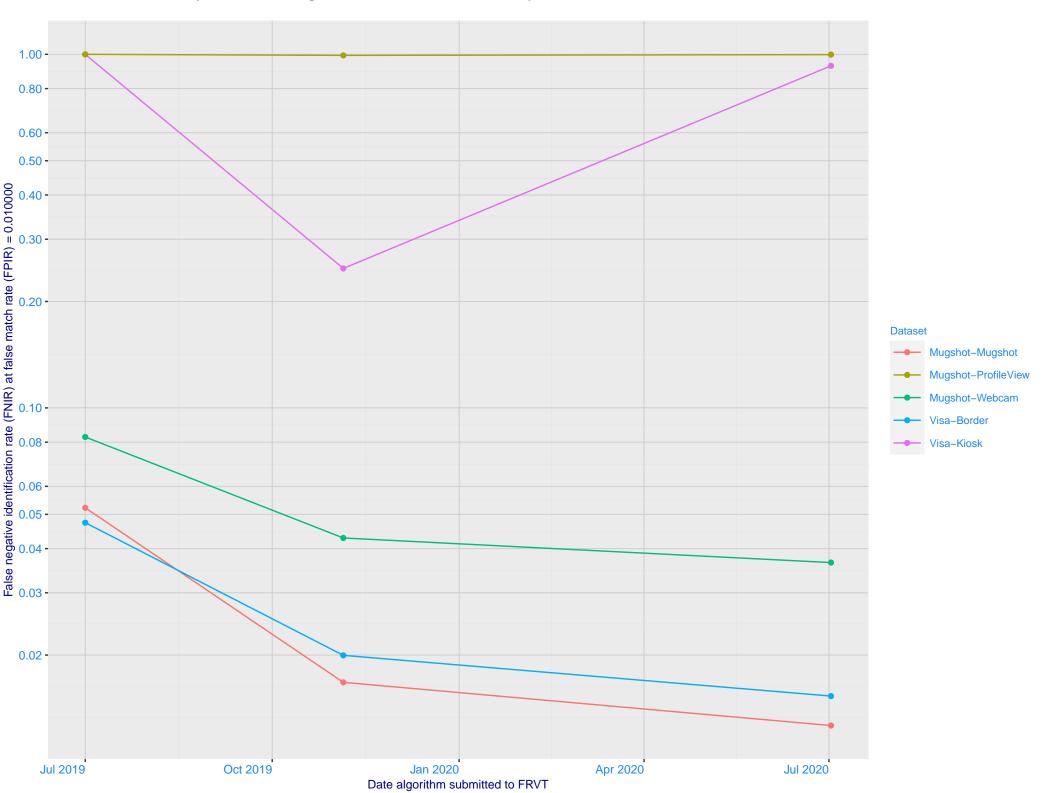
Mugshot profile ranking 144 (out of 189) -- FNIR(1600000, T, L+1) = 0.9996, FPIR=0.001000 vs. lowest 0.1733 from sensetime_005

Immigration visa-border ranking 33 (out of 139) -- FNIR(1600000, T, L+1) = 0.0374, FPIR=0.001000 vs. lowest 0.0059 from sensetime_004

Immigration visa-kiosk ranking 63 (out of 134) -- FNIR(1600000, T, L+1) = 0.5551, FPIR=0.001000 vs. lowest 0.1048 from sensetime_005



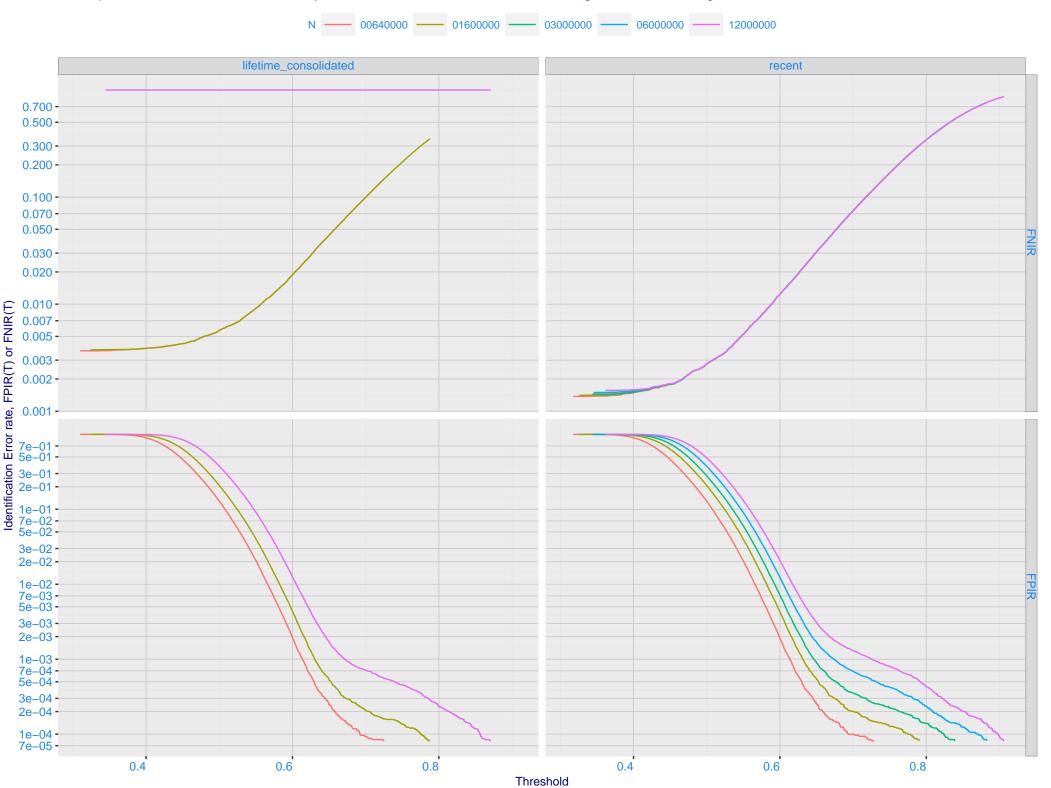
C: Evolution of accuracy for PIXELALL algorithms on three datasets 2018 – present



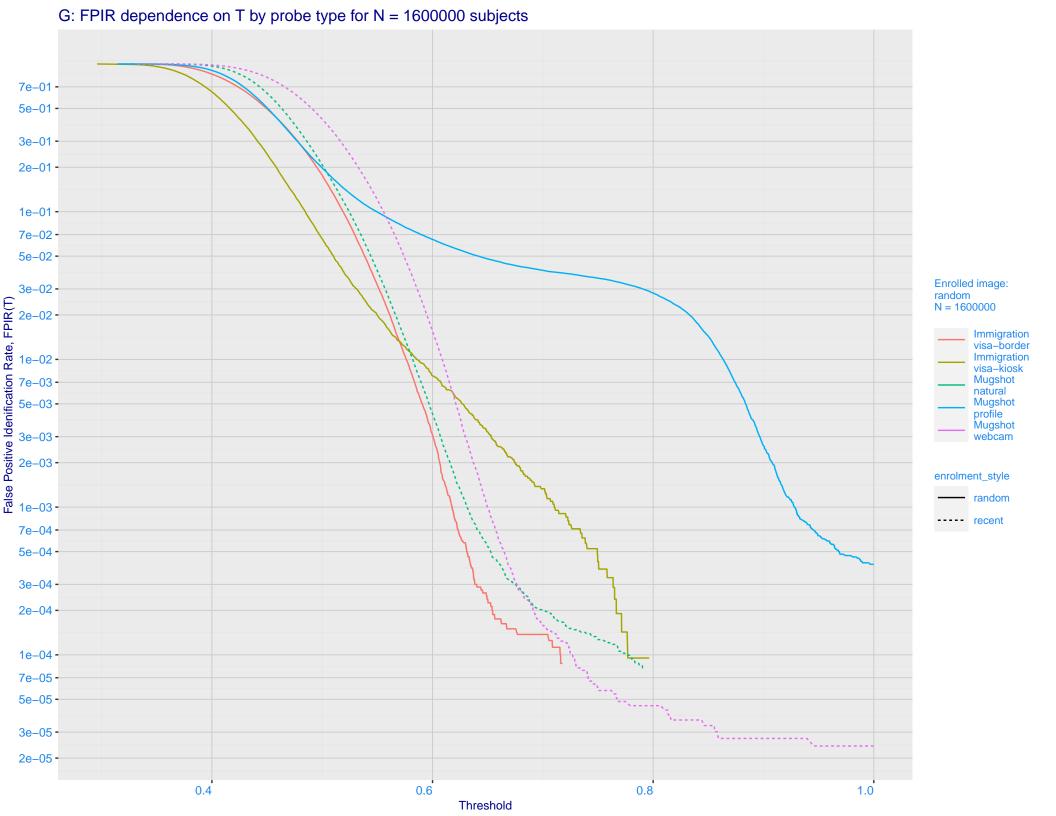
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration** Mugshot **Immigration** visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.000 - 0.000 - 0.500 -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

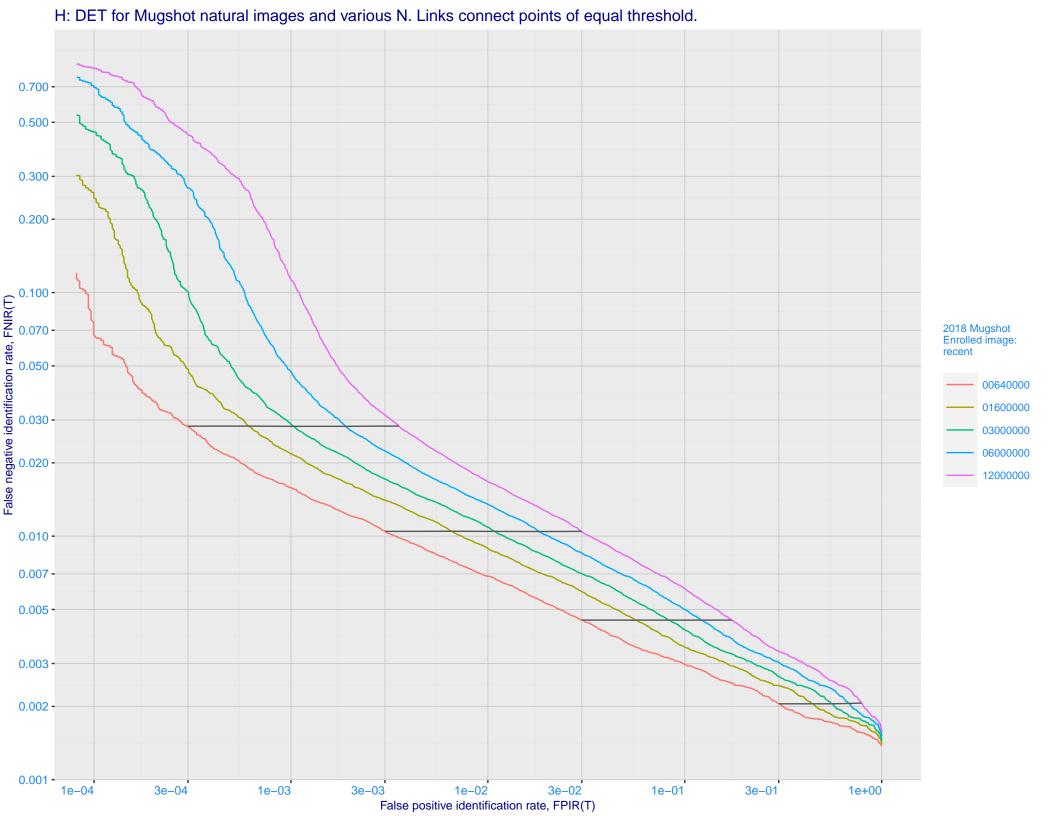
False positive identification rate, FPIR(T)

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 - 7e-02 - 3e-02 - 2e-02 - 2e-02 - 3e-02 Enrolled images: recent N = 1600000 Mugshot natural Mugshot webcam 1e-02 -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 -3e-05 1e-04 3e-04 1e-03 3e-03 1e-02 3e-02 1e-01 3e-01 False Positive Idenification Rate, FPIR(T)

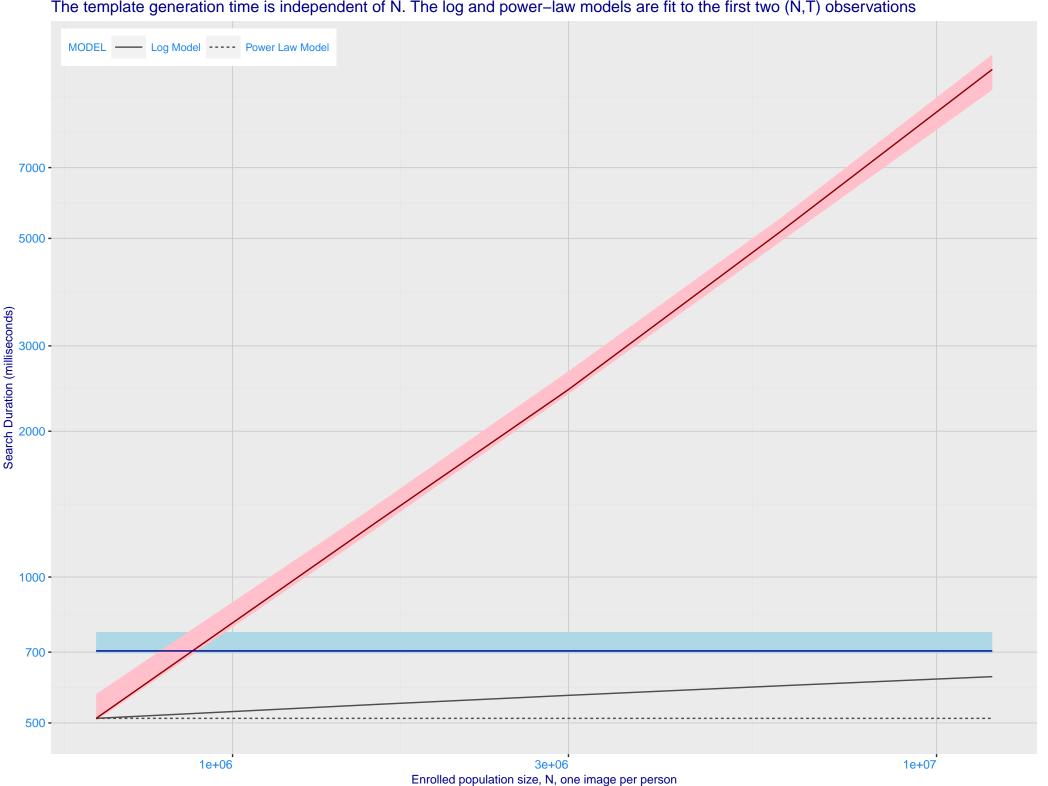




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 - 0.003 - 0.002 - 0.001 - 0.001 - 0.000 - 0.300 - 0.200 enrolment_style consolidated ---- random --- recent Mugshot Mugshot webcam natural FNIR@Rank = 1 pixelall_003 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

J: Investigational mode: FNIR(1600000, R, 0) by probe type pixelall_003 sensetime_005 0.100 -0.070 -0.050 -0.030 enrolment_style False negative identification rate, FNIR(N) 0.000 - 0. lifetime_consolidated ---- random --- recent FNIR(R) N = 1600000 Immigration visa-border Immigration visa-kiosk Mugshot natural Mugshot webcam 0.003 -0.002 -0.001 -10 30 3 10 30 Rank, R

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



