## A: Datasheet

Algorithm: pixelall\_004

Developer: Guangzhou Pixel Solutions Co Ltd

Submission Date: 2020\_07\_02

Template size: 2560 bytes

Template time (2.5 percentile): 437 msec

Template time (median): 449 msec

Template time (97.5 percentile): 479 msec

Investigation:

Frontal mugshot ranking 32 (out of 265) -- FNIR(1600000, 0, 1) = 0.0020 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 41 (out of 227) -- FNIR(1600000, 0, 1) = 0.0145 vs. lowest 0.0062 from sensetime\_005

Mugshot profile ranking 51 (out of 196) -- FNIR(1600000, 0, 1) = 0.5235 vs. lowest 0.0591 from sensetime\_005

Immigration visa-border ranking 38 (out of 148) -- FNIR(1600000, 0, 1) = 0.0054 vs. lowest 0.0013 from visionlabs\_010

Immigration visa-kiosk ranking 65 (out of 145) -- FNIR(1600000, 0, 1) = 0.1517 vs. lowest 0.0568 from hr\_000

Identification:

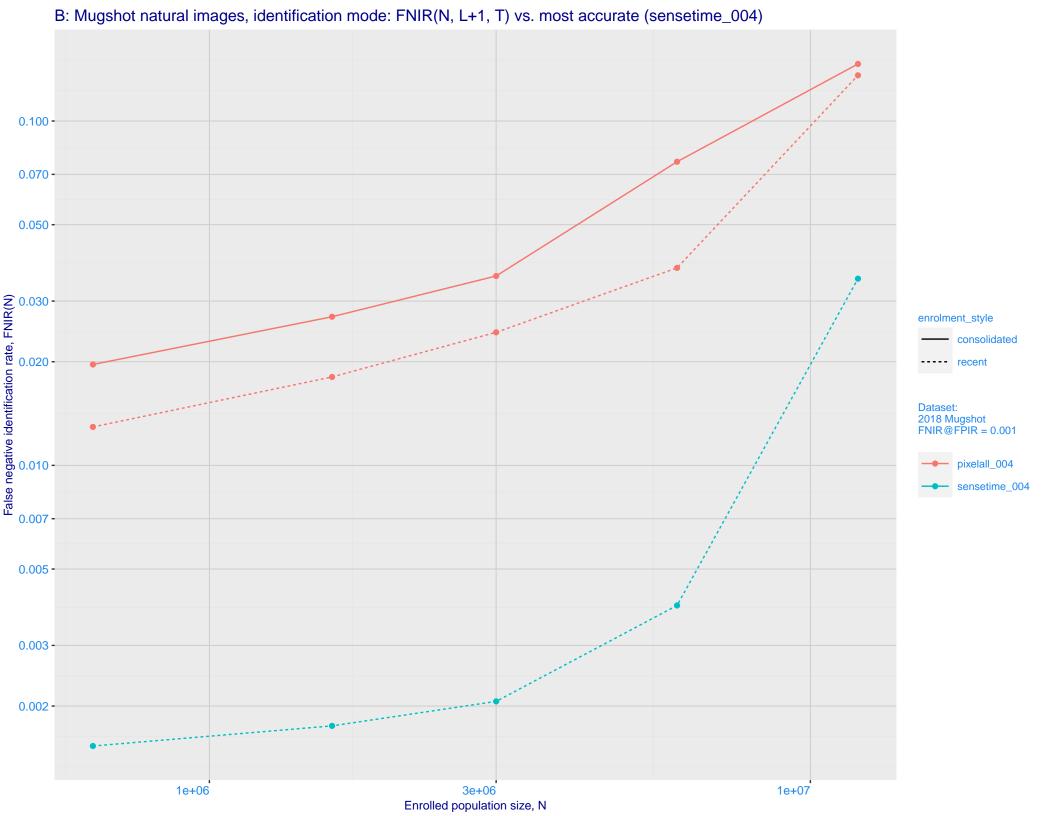
Frontal mugshot ranking 32 (out of 265) -- FNIR(1600000, T, L+1) = 0.0181, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 45 (out of 225) -- FNIR(1600000, T, L+1) = 0.0787, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

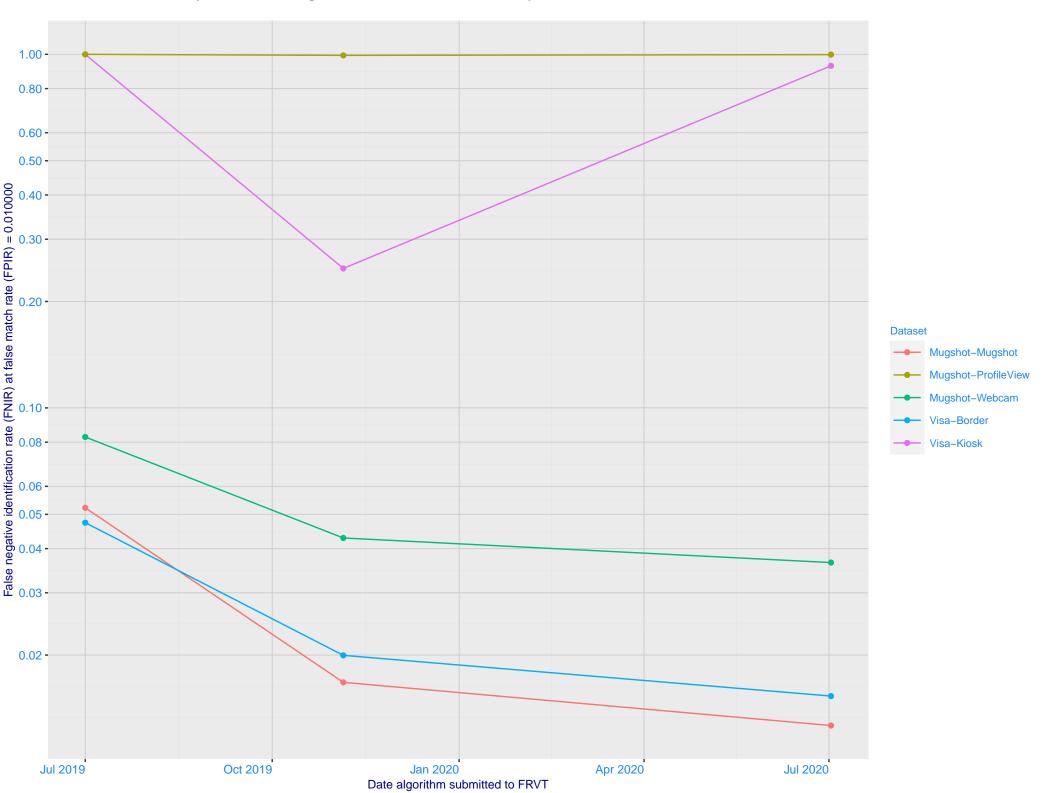
Mugshot profile ranking 164 (out of 195) -- FNIR(1600000, T, L+1) = 0.9999, FPIR=0.001000 vs. lowest 0.1331 from hr\_000

Immigration visa-border ranking 42 (out of 146) -- FNIR(1600000, T, L+1) = 0.0508, FPIR=0.001000 vs. lowest 0.0049 from hr\_000

Immigration visa-kiosk ranking 126 (out of 141) -- FNIR(1600000, T, L+1) = 0.9938, FPIR=0.001000 vs. lowest 0.0996 from hr\_000



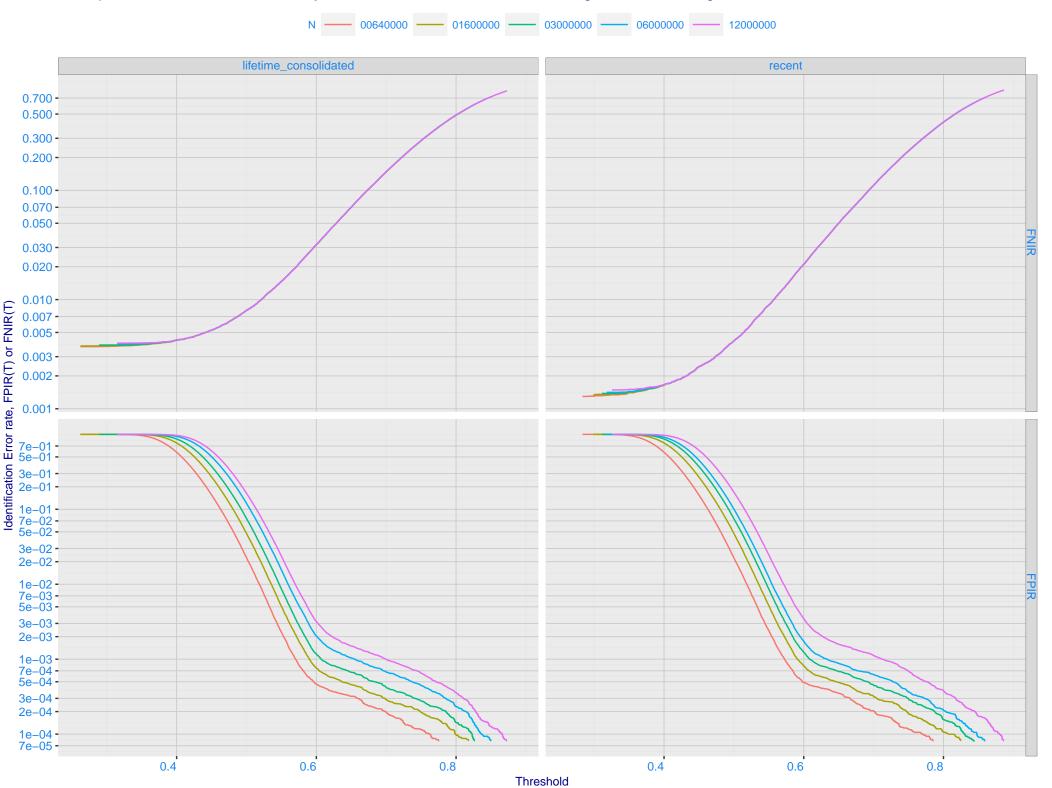
C: Evolution of accuracy for PIXELALL algorithms on three datasets 2018 – present



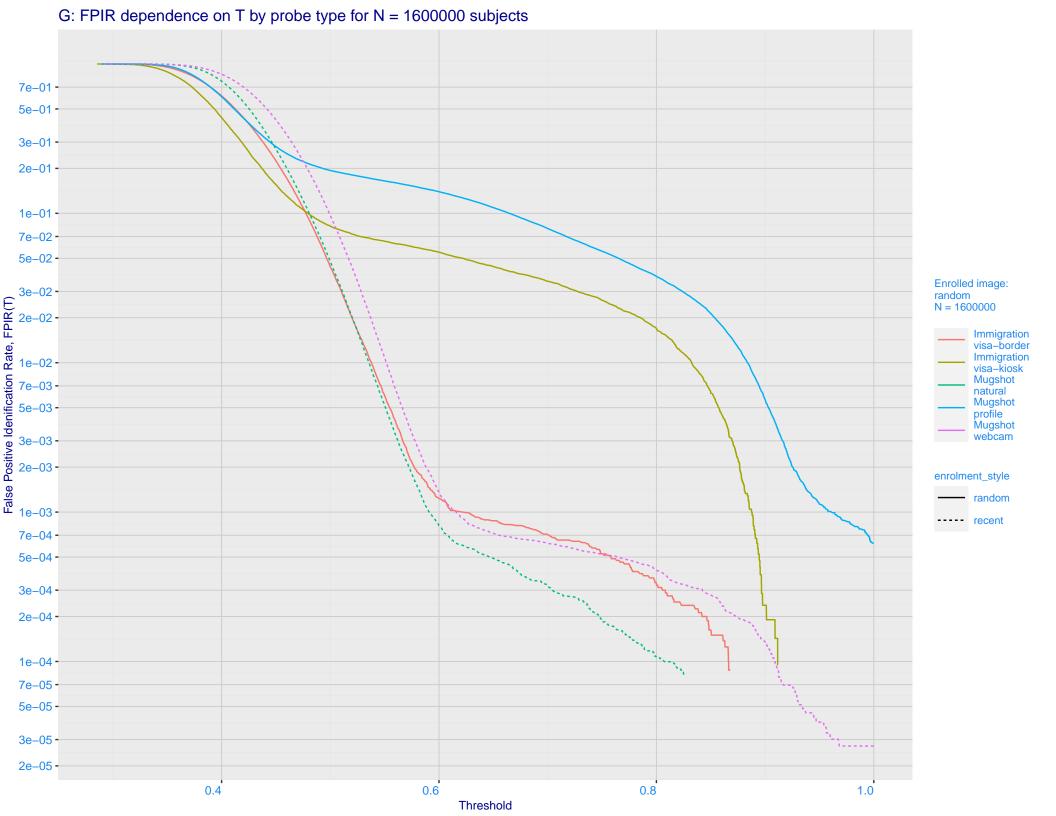
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 - 0.005 - 0.005 - 0.002 - 0.001 - 0.001 - 0.700 - 0.500 - 0.200 enrolment\_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

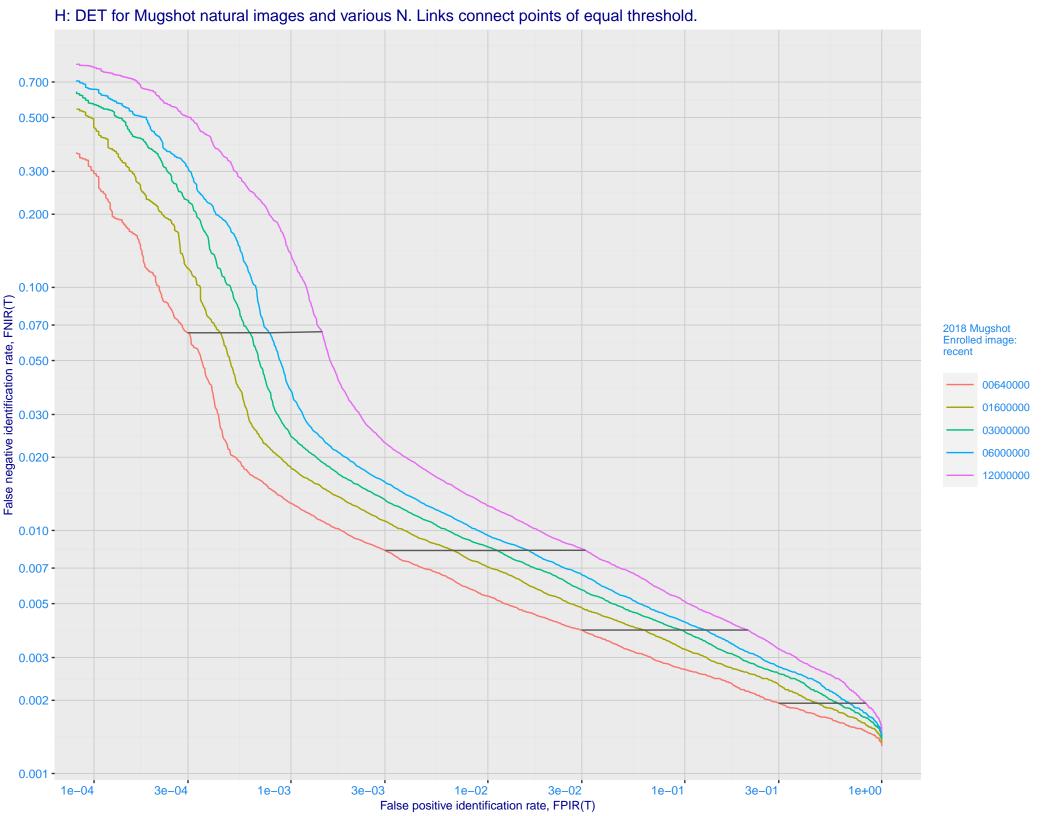
False positive identification rate, FPIR(T)

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 - 2e-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)

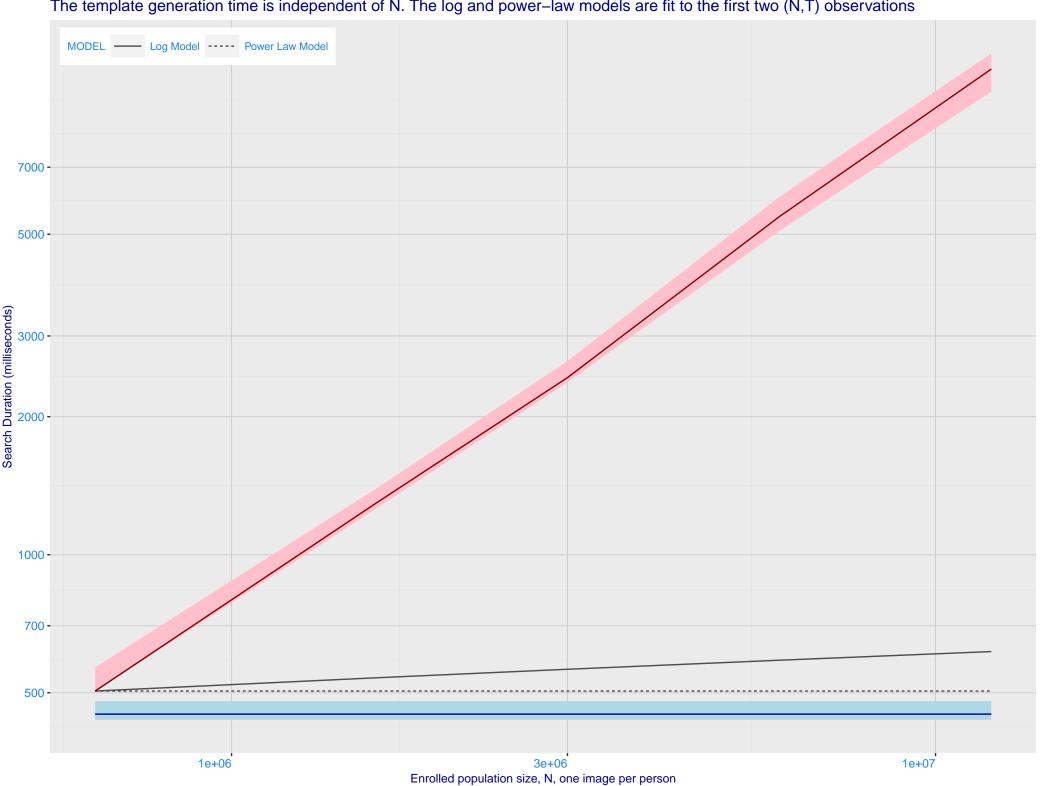




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 - 0.002 - 0.001 - 0.001 - 0.000 - 0.000 - 0.050 enrolment\_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 pixelall\_004 - sensetime\_005 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\_004 sensetime\_005 0.100 -0.070 -0.050 -0.030 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 0.003 -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



