## A: Datasheet

Algorithm: ntechlab\_007

Developer: N-Tech Lab

Submission Date: 2019\_06\_25

Template size: 3348 bytes

Template time (2.5 percentile): 791 msec

Template time (median): 795 msec

Template time (97.5 percentile): 1016 msec

Investigation:

Frontal mugshot ranking 43 (out of 259) -- FNIR(1600000, 0, 1) = 0.0027 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 25 (out of 221) -- FNIR(1600000, 0, 1) = 0.0125 vs. lowest 0.0062 from sensetime\_005

Mugshot profile ranking 24 (out of 190) -- FNIR(1600000, 0, 1) = 0.3259 vs. lowest 0.0591 from sensetime\_005

Immigration visa-border ranking 26 (out of 142) -- FNIR(1600000, 0, 1) = 0.0044 vs. lowest 0.0014 from visionlabs\_009

Immigration visa-kiosk ranking 28 (out of 139) -- FNIR(1600000, 0, 1) = 0.1066 vs. lowest 0.0694 from cib\_000

Identification:

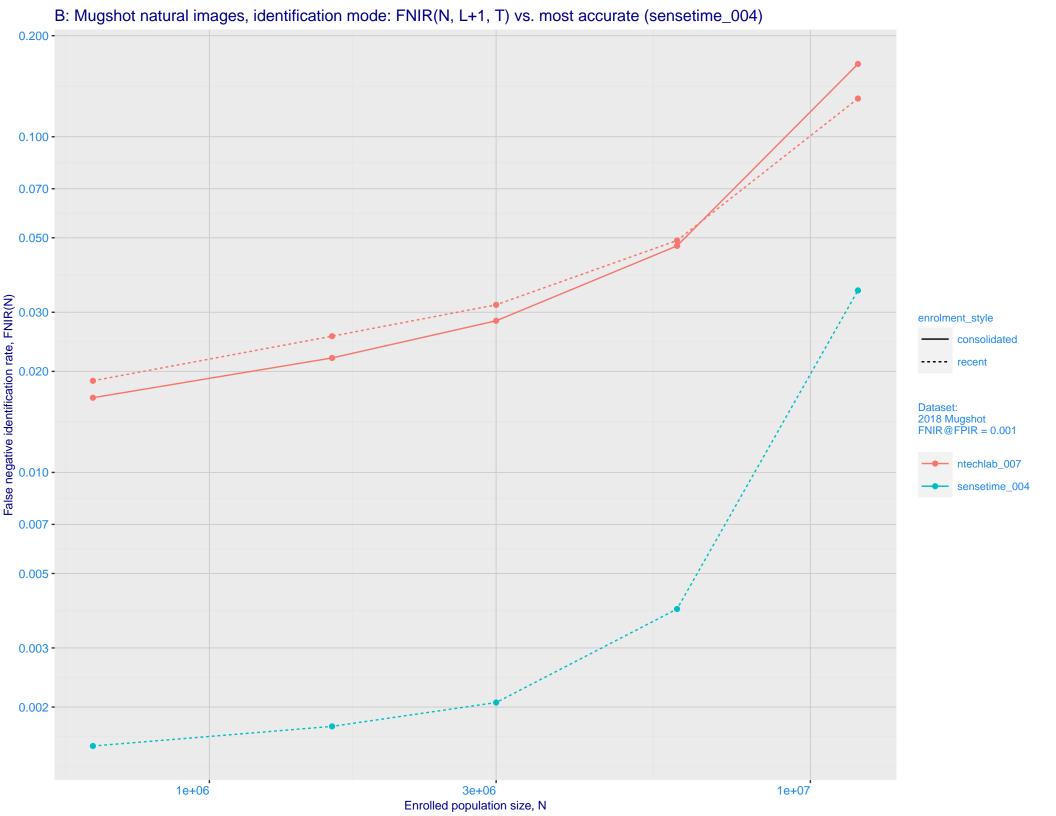
Frontal mugshot ranking 41 (out of 259) -- FNIR(1600000, T, L+1) = 0.0255, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 32 (out of 219) -- FNIR(1600000, T, L+1) = 0.0668, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

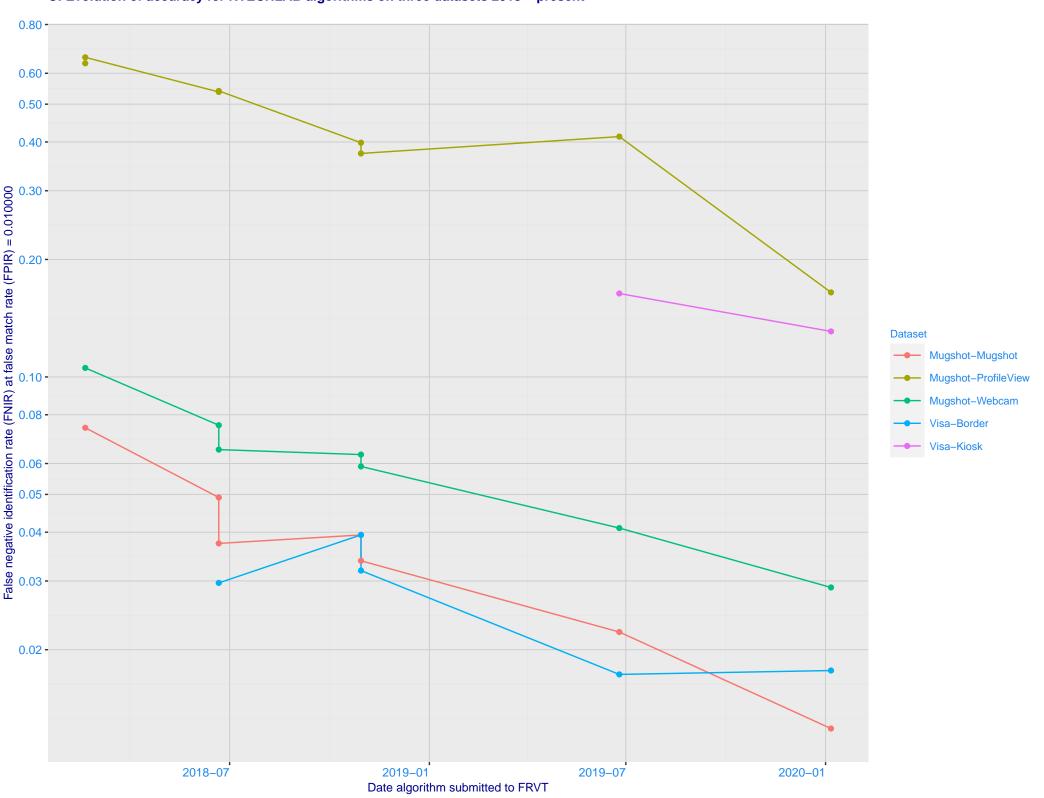
Mugshot profile ranking 14 (out of 189) -- FNIR(1600000, T, L+1) = 0.7499, FPIR=0.001000 vs. lowest 0.1733 from sensetime\_005

Immigration visa-border ranking 27 (out of 139) -- FNIR(1600000, T, L+1) = 0.0323, FPIR=0.001000 vs. lowest 0.0059 from sensetime\_004

Immigration visa-kiosk ranking 20 (out of 134) -- FNIR(1600000, T, L+1) = 0.2241, FPIR=0.001000 vs. lowest 0.1048 from sensetime\_005



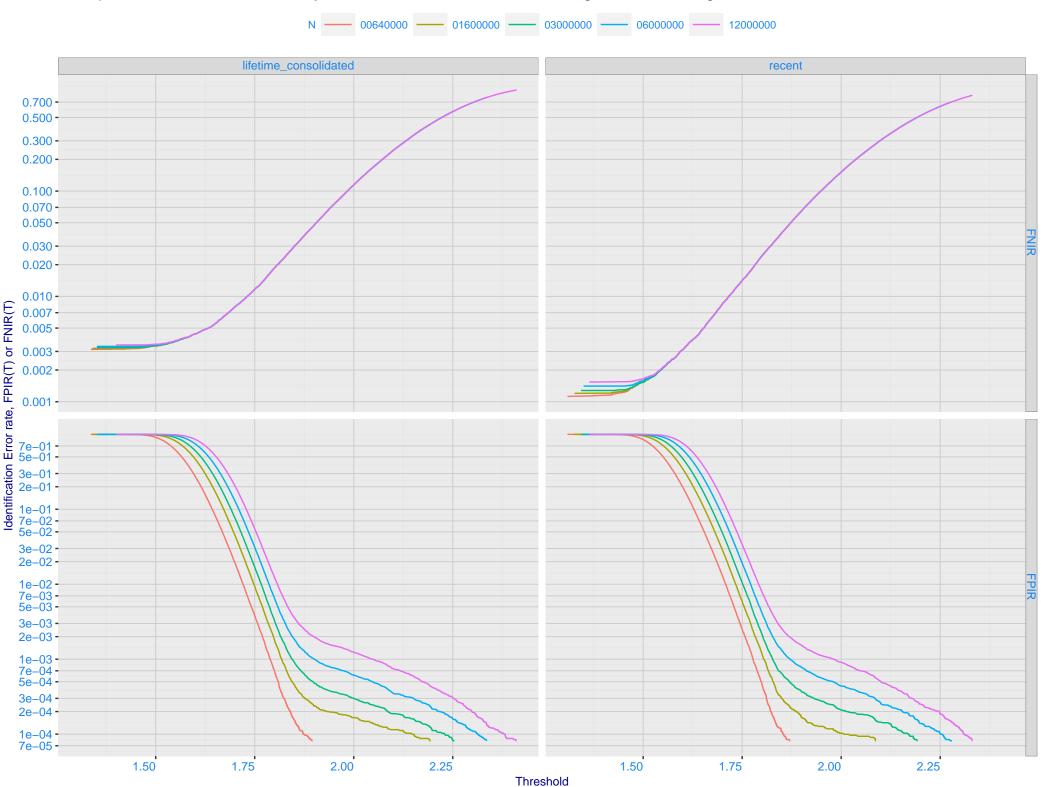
C: Evolution of accuracy for NTECHLAB algorithms on three datasets 2018 – present



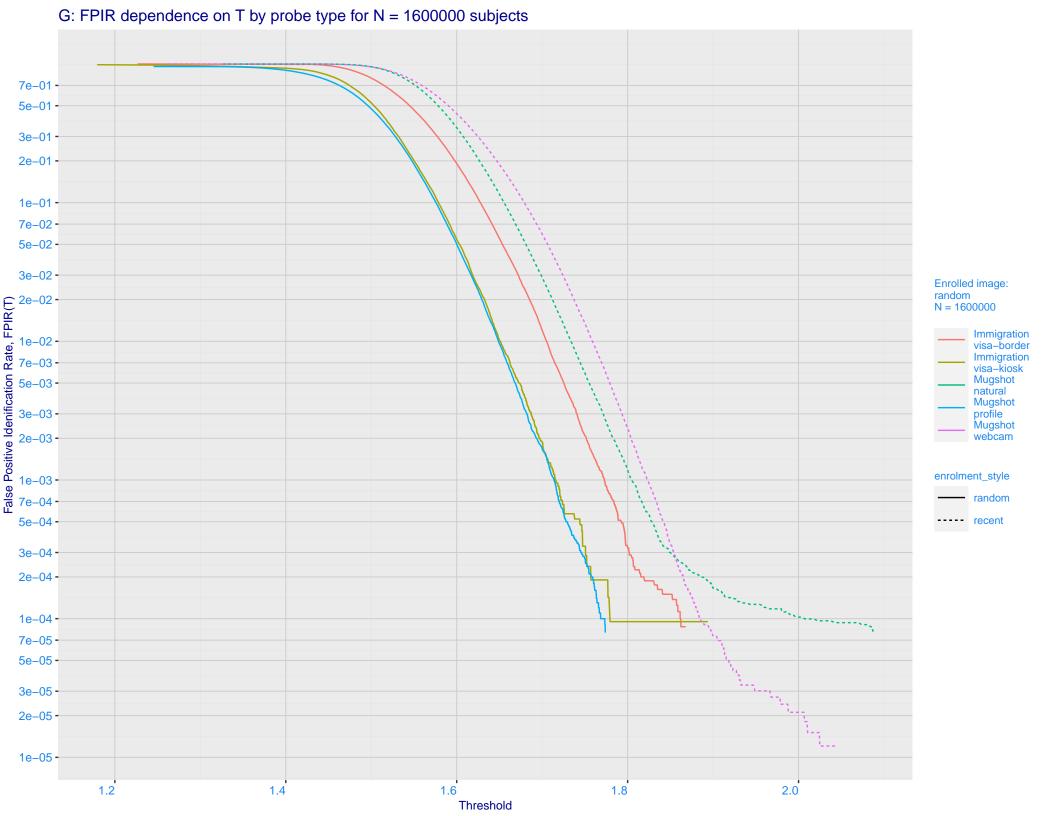
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.0001 - 0.700 - 0.500 - 0.200 - 0.100 - 0 enrolment\_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

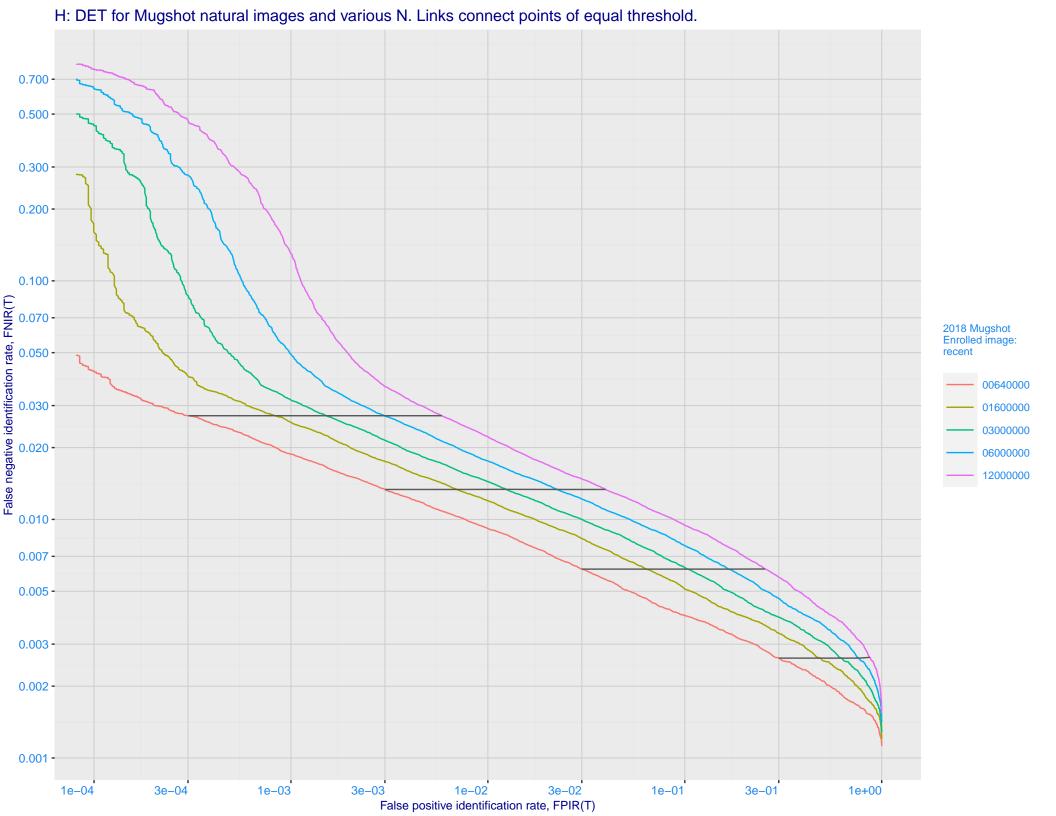
False positive identification rate, FPIR(T)

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

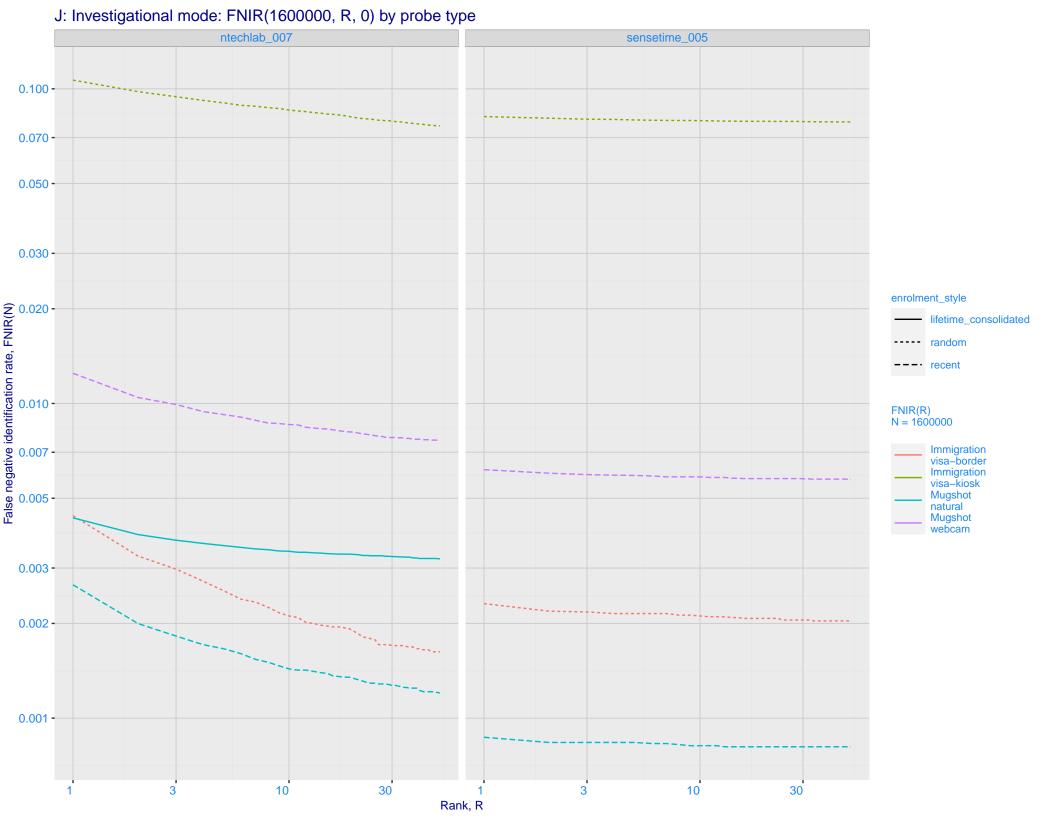


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

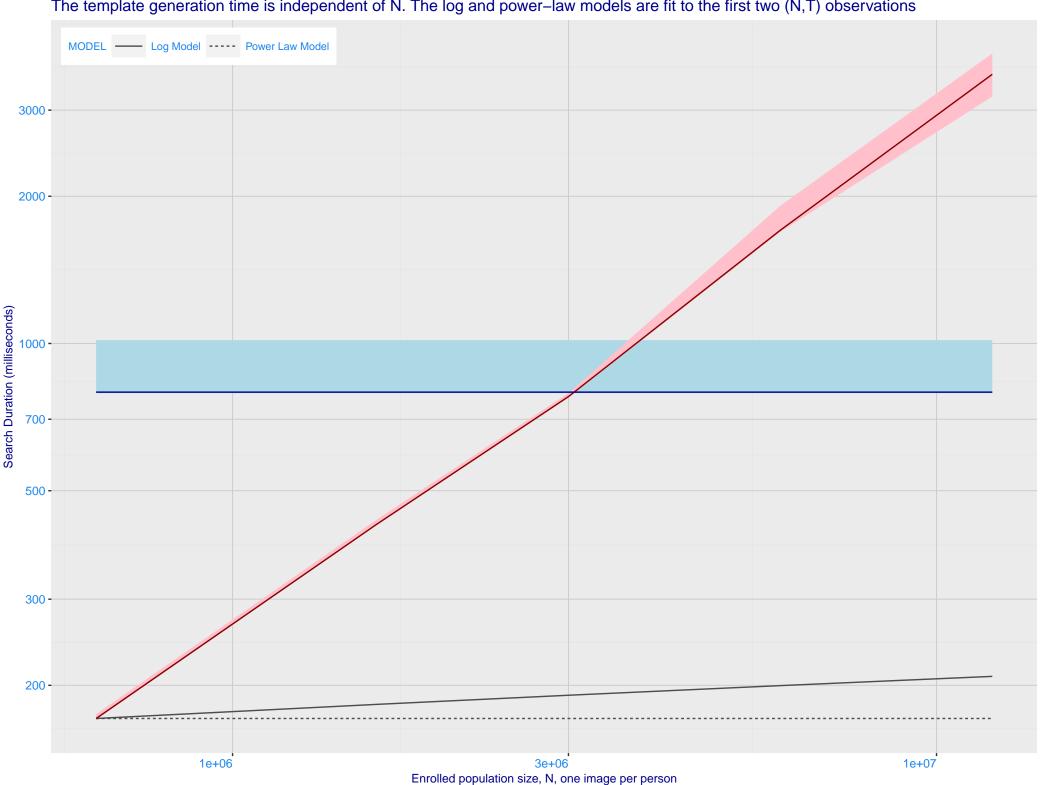




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 - 0.002 - 0.001 - 0.001 - 0.000 FNIR@Rank = 1 ntechlab\_007 sensetime\_005 Mugshot webcam Mugshot natural enrolment\_style consolidated ---- random --- recent 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



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



