## A: Datasheet

Algorithm: kneron\_000

Developer: Kneron

Submission Date: 2020\_03\_03

Template size: 2048 bytes

Template time (2.5 percentile): 521 msec

Template time (median): 523 msec

Template time (97.5 percentile): 573 msec

Investigation:

Frontal mugshot ranking 86 (out of 259) -- FNIR(1600000, 0, 1) = 0.0059 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 100 (out of 221) -- FNIR(1600000, 0, 1) = 0.0273 vs. lowest 0.0062 from sensetime\_005

Mugshot profile ranking 53 (out of 190) -- FNIR(1600000, 0, 1) = 0.5518 vs. lowest 0.0591 from sensetime\_005

Immigration visa-border ranking 74 (out of 142) -- FNIR(1600000, 0, 1) = 0.0284 vs. lowest 0.0014 from visionlabs\_009

Immigration visa-kiosk ranking 70 (out of 139) -- FNIR(1600000, 0, 1) = 0.1945 vs. lowest 0.0694 from cib\_000

Identification:

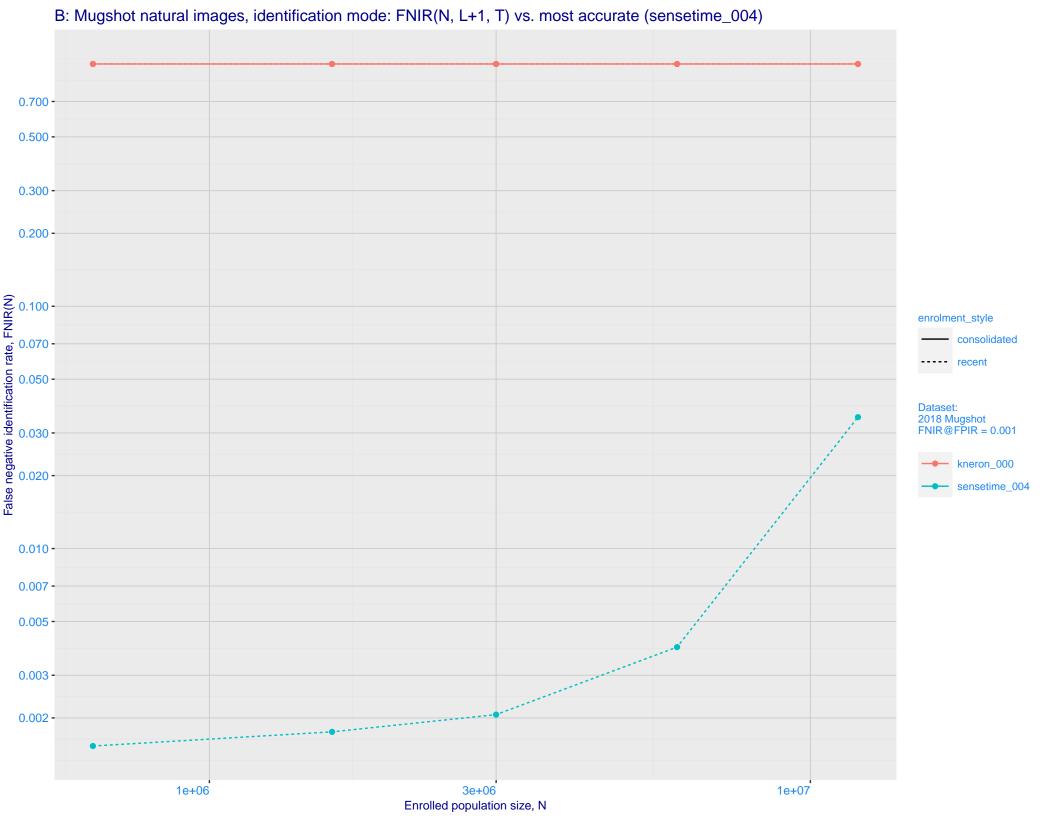
Frontal mugshot ranking 258 (out of 259) -- FNIR(1600000, T, L+1) = 0.9998, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 217 (out of 219) -- FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

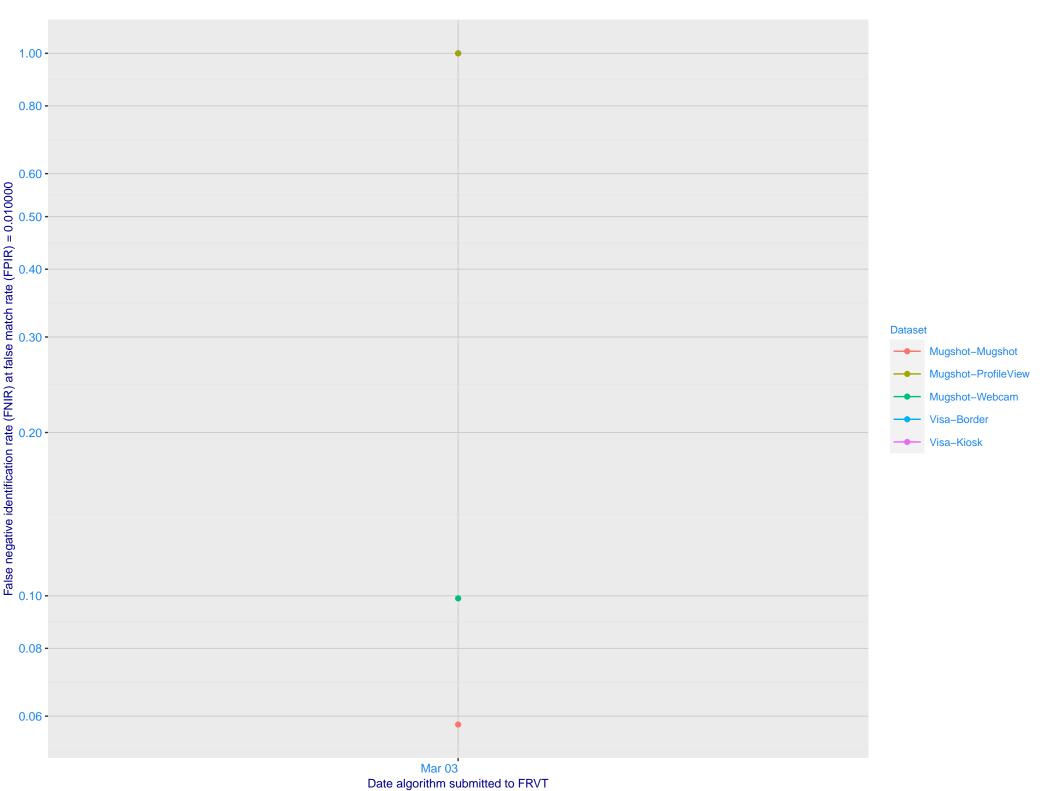
Mugshot profile ranking 182 (out of 189) -- FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.1733 from sensetime\_005

Immigration visa-border ranking 134 (out of 139) -- FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.0059 from sensetime\_004

Immigration visa-kiosk ranking 130 (out of 134) -- FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.1048 from sensetime\_005



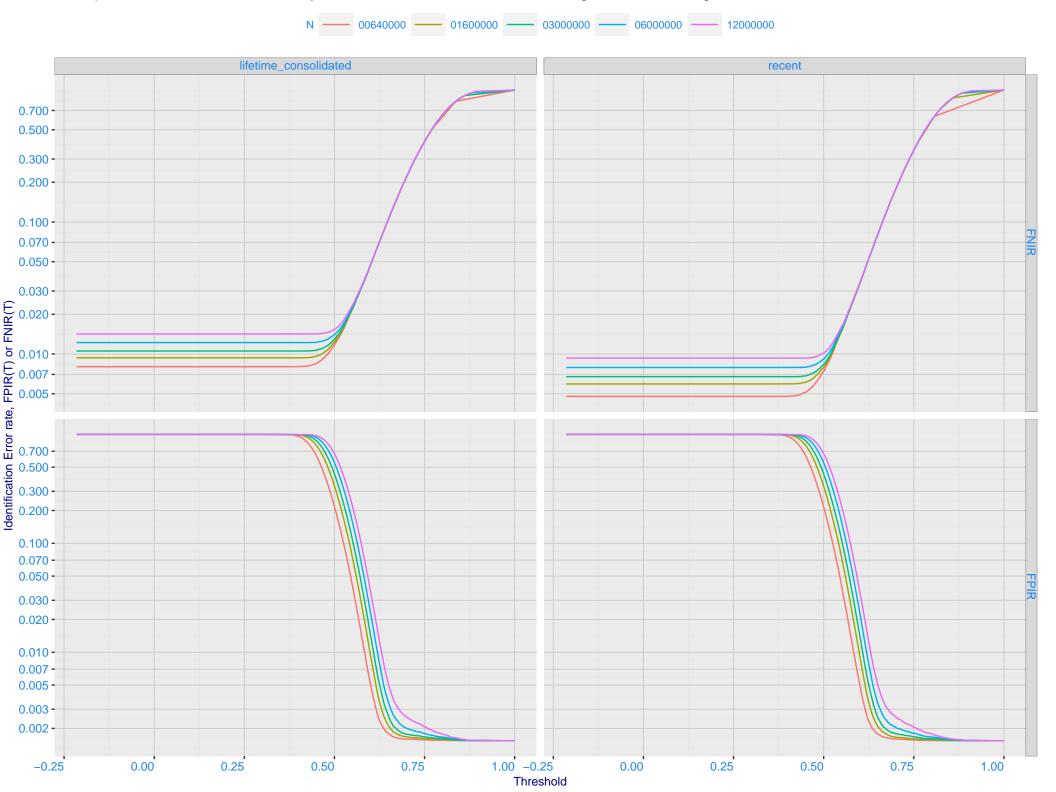
## C: Evolution of accuracy for KNERON algorithms on three datasets 2018 – present



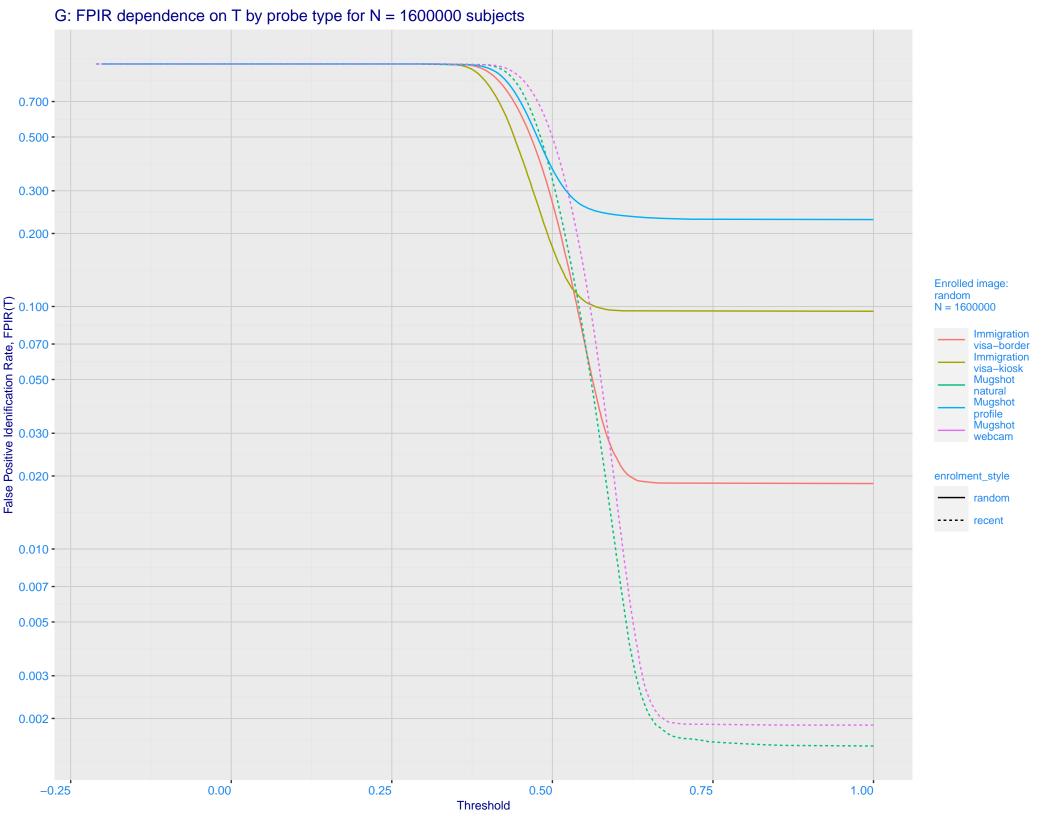
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration** Mugshot **Immigration** visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 - 0.005 - 0.005 - 0.002 - 0.001 - 0.001 - 0.700 - 0.500 - 0.200 enrolment\_style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

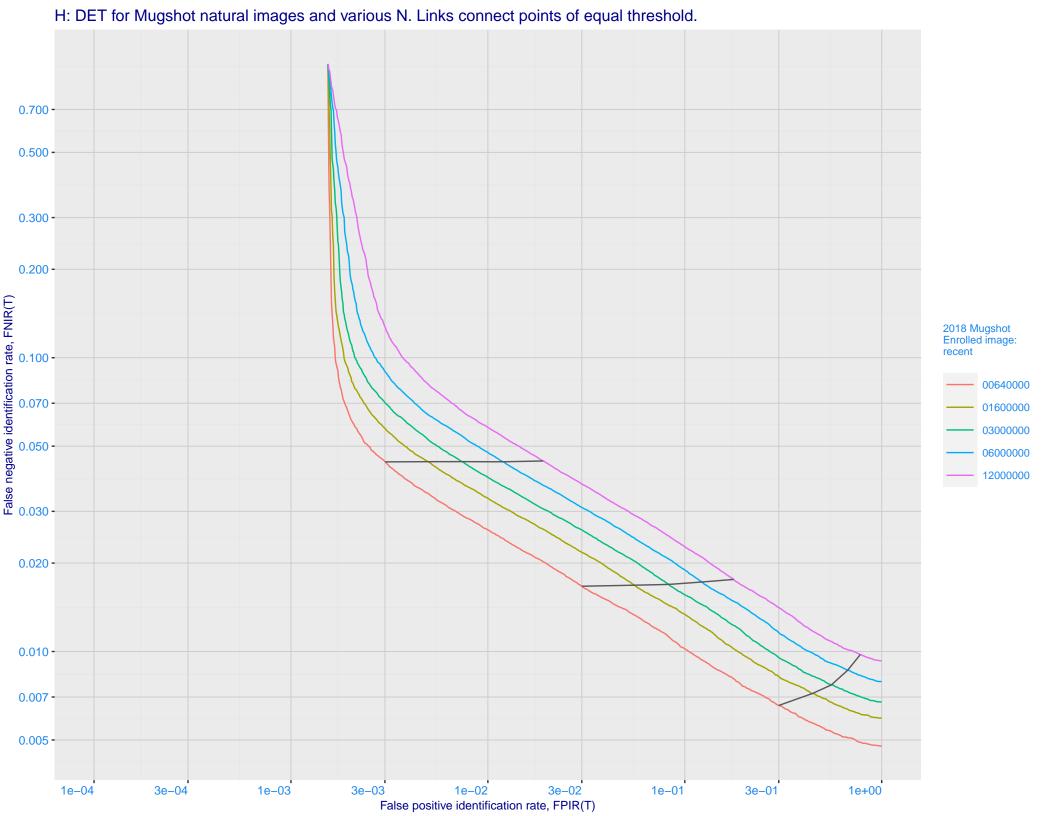
False positive identification rate, FPIR(T)

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 -Selectivity, SEL(T) 3e-01 -3e-01 -2e-01 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam 1e-01 -7e-02 -5e-02 -3e-02 -2e-02 -1e-02 -7e-03 -5e-03 -3e-03 -2e-03 -1e-03 -0.010 0.003 0.030 0.100 0.300 False Positive Idenification Rate, FPIR(T)

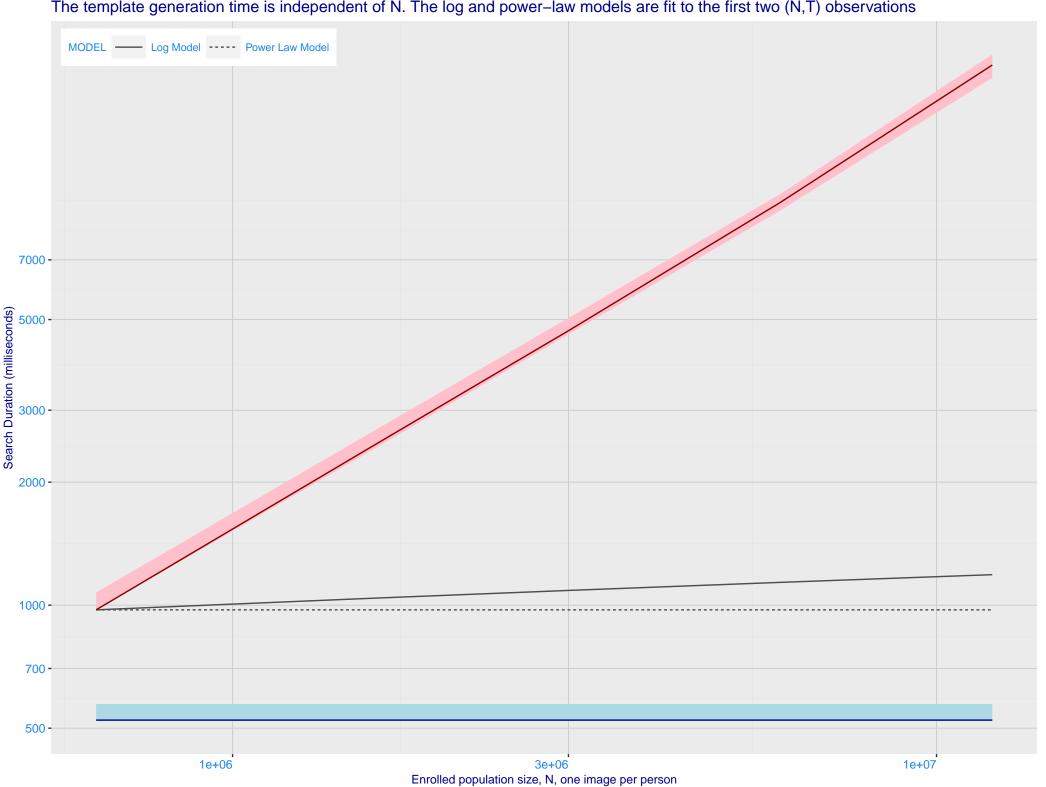




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration Immigration visa-border visa-kiosk 0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Ealse negative identification rate, FNIR(N) 0.003 - 0.001 - 0.001 - 0.200 - 0.100 - 0.050 - 0. enrolment\_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 hneron\_000 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 kneron\_000 sensetime\_005 0.200 -0.100 -0.070 -0.050 enrolment\_style Ealse 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



