## A: Datasheet

Algorithm: hik\_6

Developer: Hikvision Research Institute

Submission Date: 2018\_10\_29

Template size: 1408 bytes

Template time (2.5 percentile): 598 msec

Template time (median): 598 msec

Template time (97.5 percentile): 646 msec

Investigation:

Frontal mugshot ranking 78 (out of 265) -- FNIR(1600000, 0, 1) = 0.0046 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 52 (out of 227) -- FNIR(1600000, 0, 1) = 0.0165 vs. lowest 0.0062 from sensetime\_005

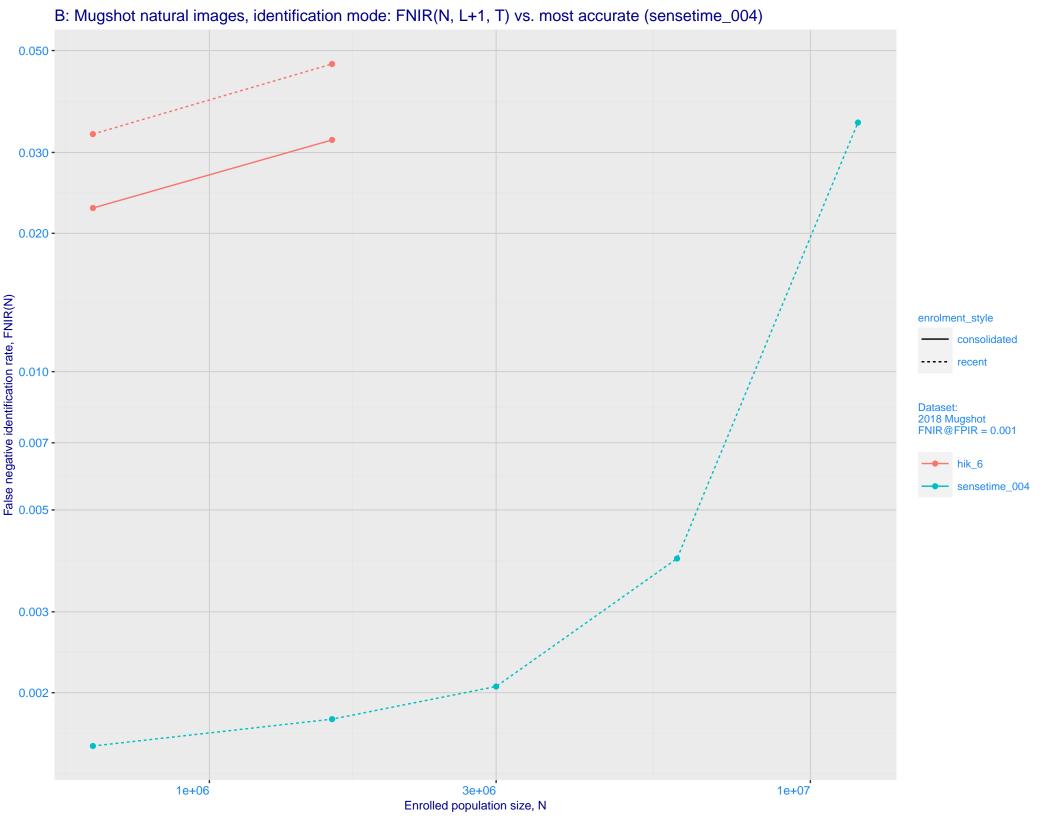
Mugshot profile ranking 55 (out of 196) -- FNIR(1600000, 0, 1) = 0.5353 vs. lowest 0.0591 from sensetime\_005

Identification:

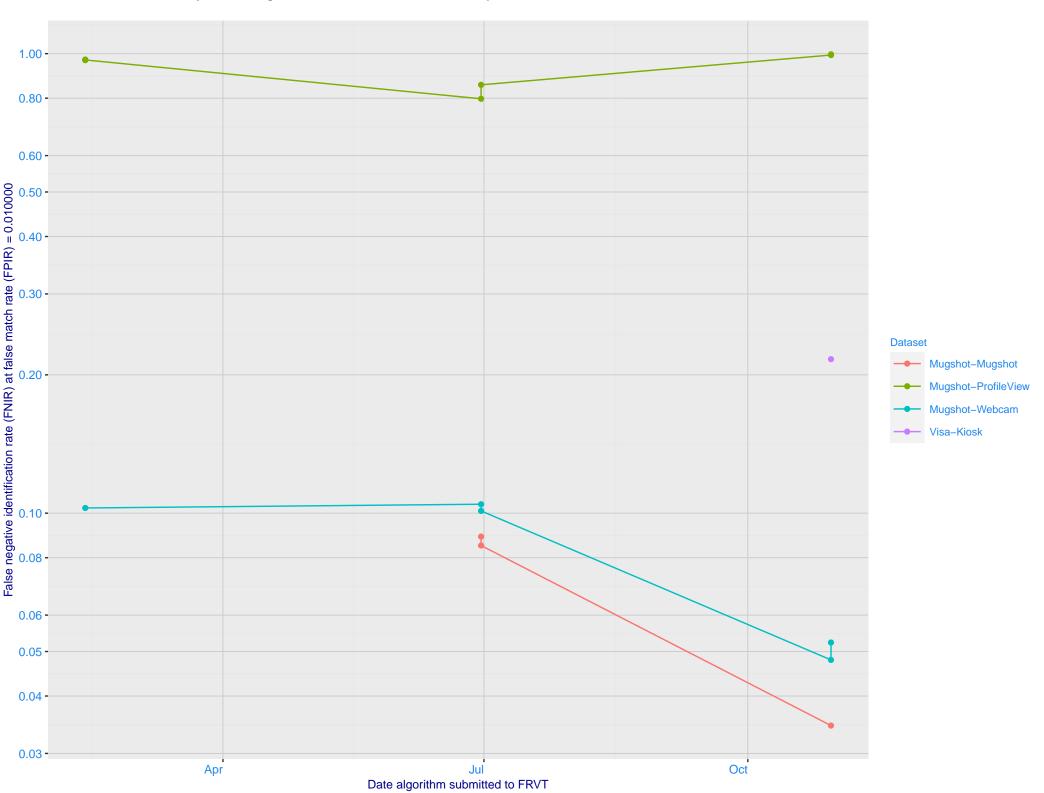
Frontal mugshot ranking 76 (out of 265) -- FNIR(1600000, T, L+1) = 0.0467, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 48 (out of 225) -- FNIR(1600000, T, L+1) = 0.0857, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

Mugshot profile ranking 176 (out of 195) -- FNIR(1600000, T, L+1) = 0.9999, FPIR=0.001000 vs. lowest 0.1331 from hr\_000

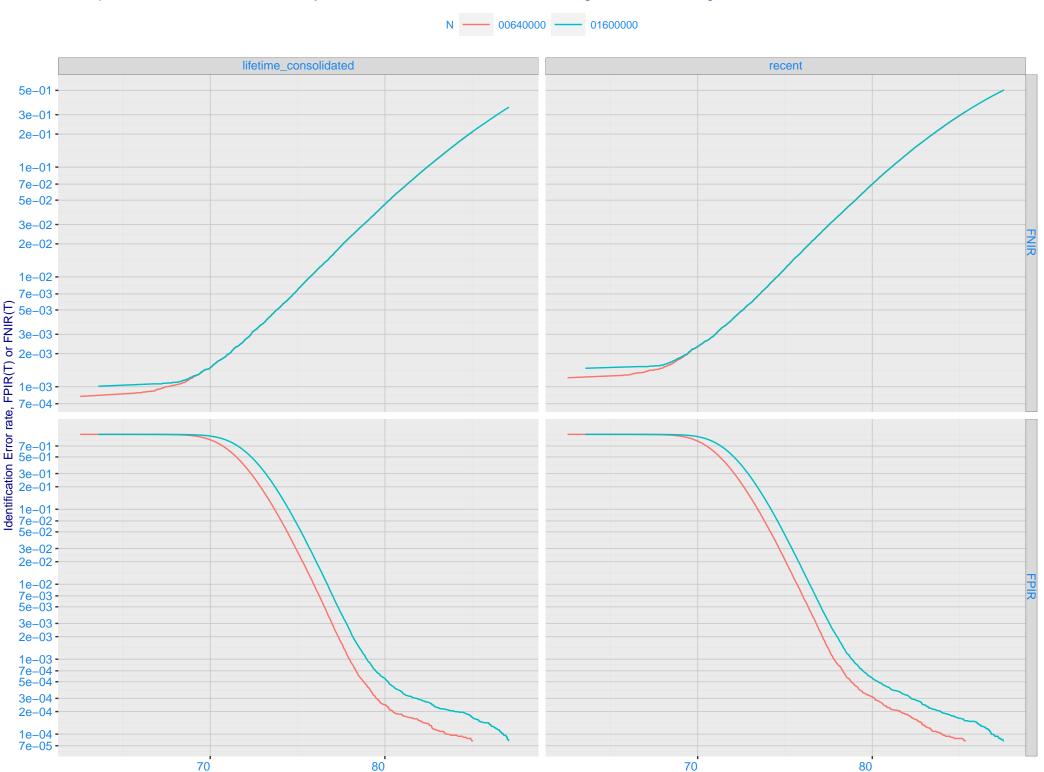


C: Evolution of accuracy for HIK algorithms on three datasets 2018 - present



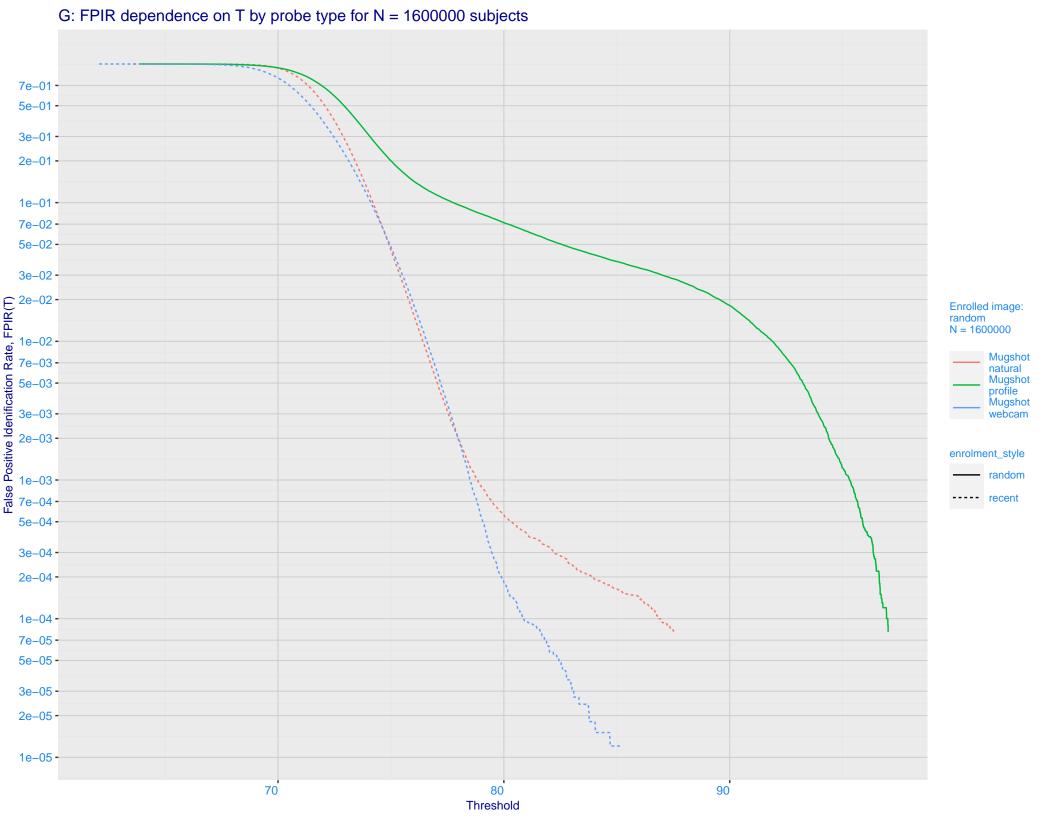
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.002 - 0.000 - 0.500 - 0.500 - 0.200 - 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 -

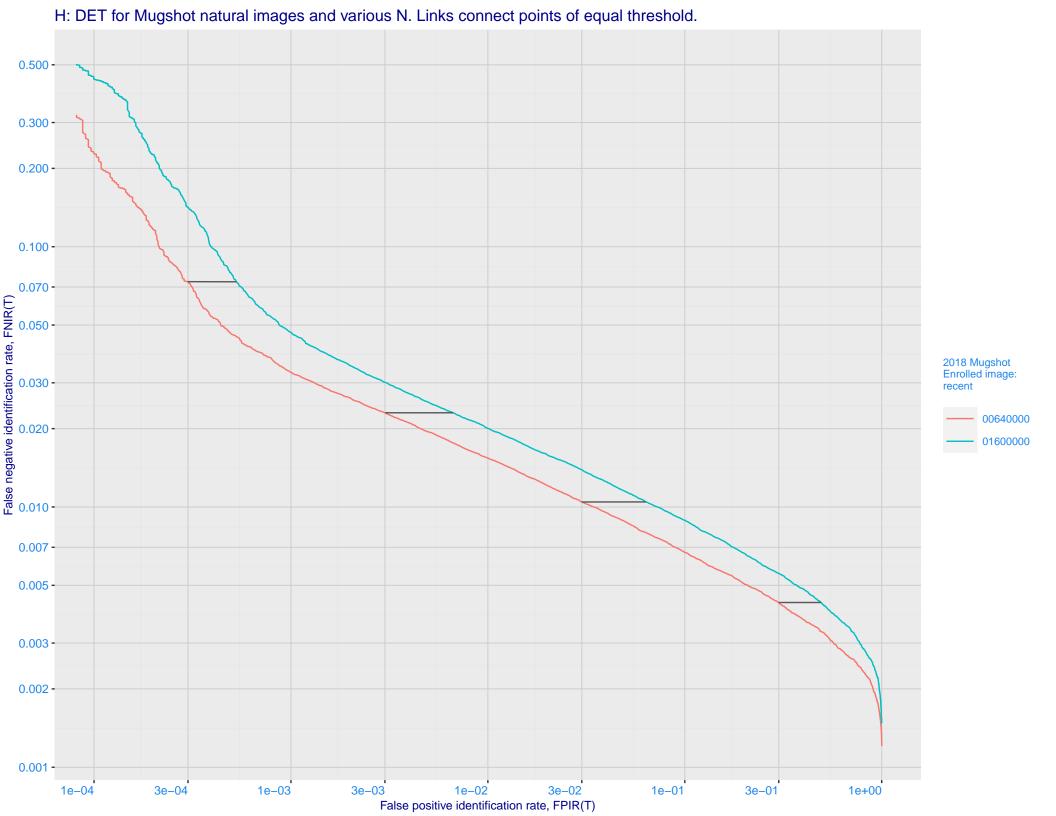
E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



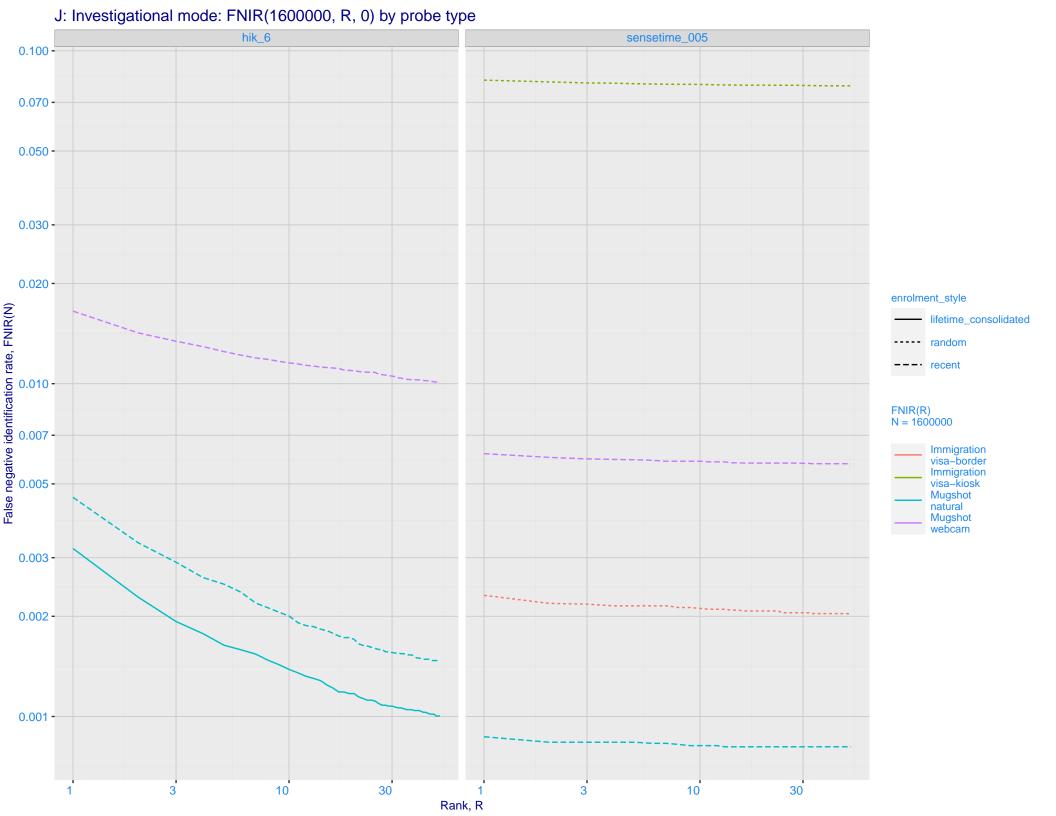
Threshold

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)

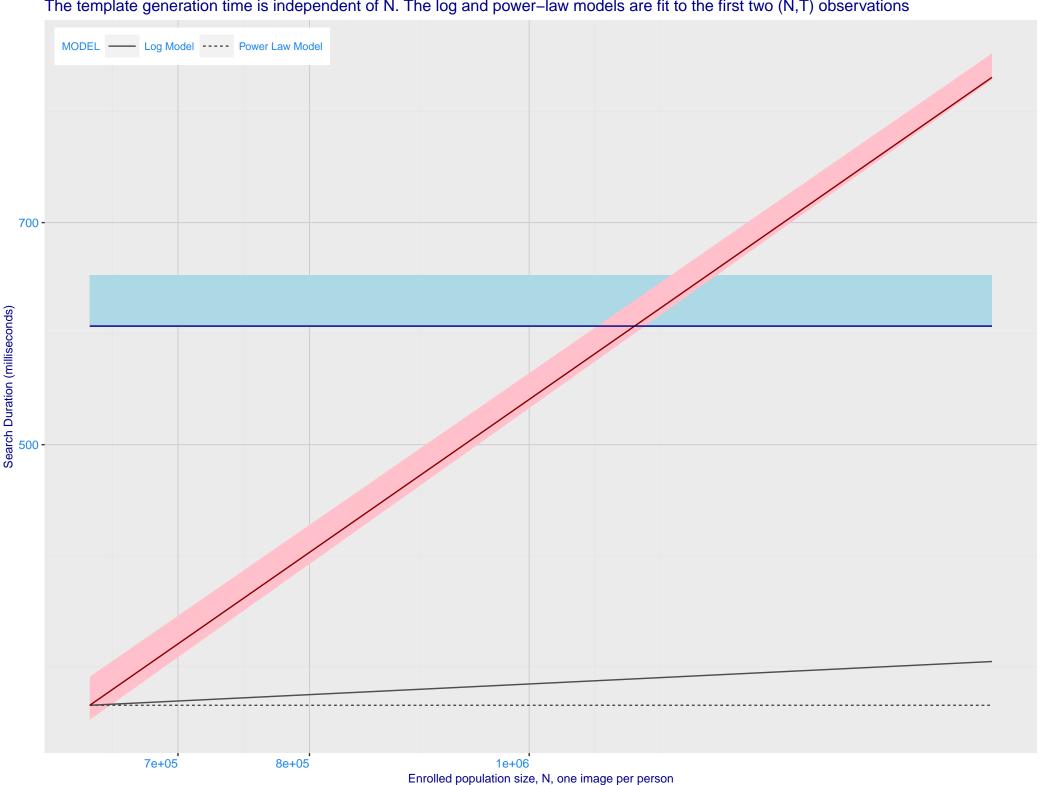




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.030 - 0. enrolment\_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 -- hik\_6 sensetime\_005 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 - Log Model ---- Power Law Model



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



