A: Datasheet

Algorithm: hik_4

Developer: Hikvision Research Institute

Submission Date: 2018_06_30

Template size: 1152 bytes

Template time (2.5 percentile): 491 msec

Template time (median): 494 msec

Template time (97.5 percentile): 655 msec

Investigation:

Frontal mugshot ranking 148 (out of 279) -- FNIR(1600000, 0, 1) = 0.0113 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 116 (out of 241) -- FNIR(1600000, 0, 1) = 0.0272 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 92 (out of 210) -- FNIR(1600000, 0, 1) = 0.7433 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 75 (out of 168) — FNIR(1600000, 0, 1) = 0.0120 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 78 (out of 165) -- FNIR(1600000, 0, 1) = 0.1524 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

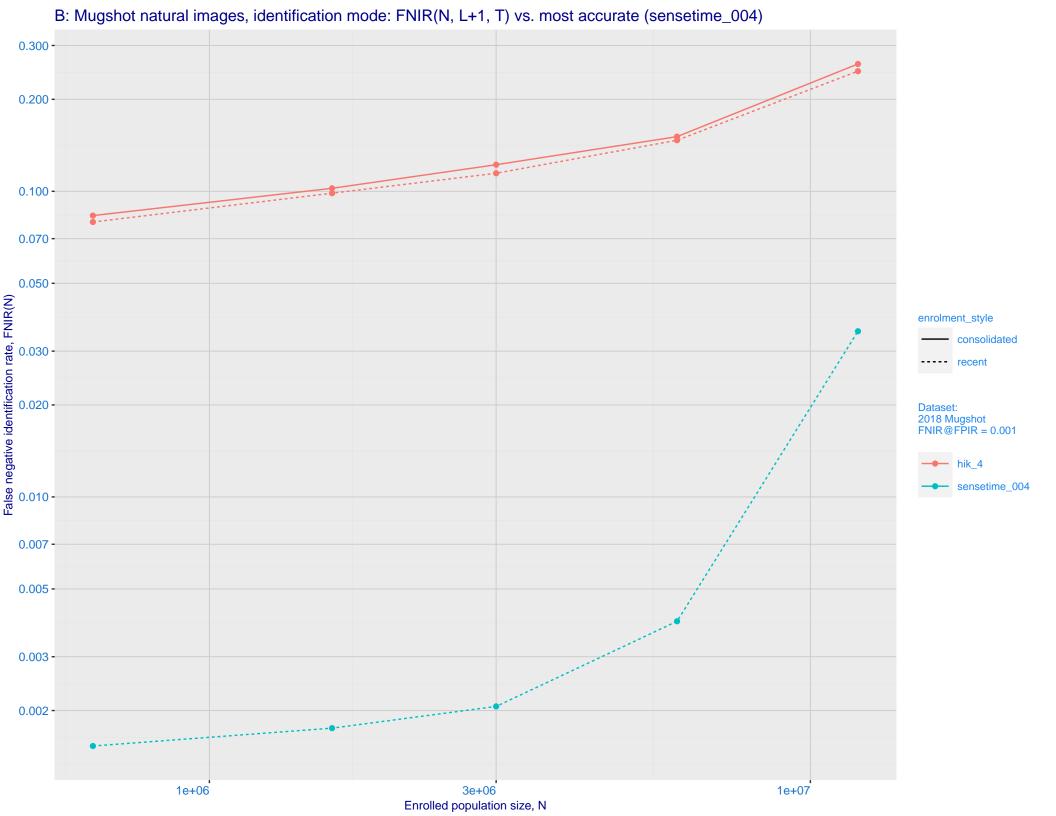
Frontal mugshot ranking 143 (out of 279) -- FNIR(1600000, T, L+1) = 0.0986, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 115 (out of 236) -- FNIR(1600000, T, L+1) = 0.1523, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

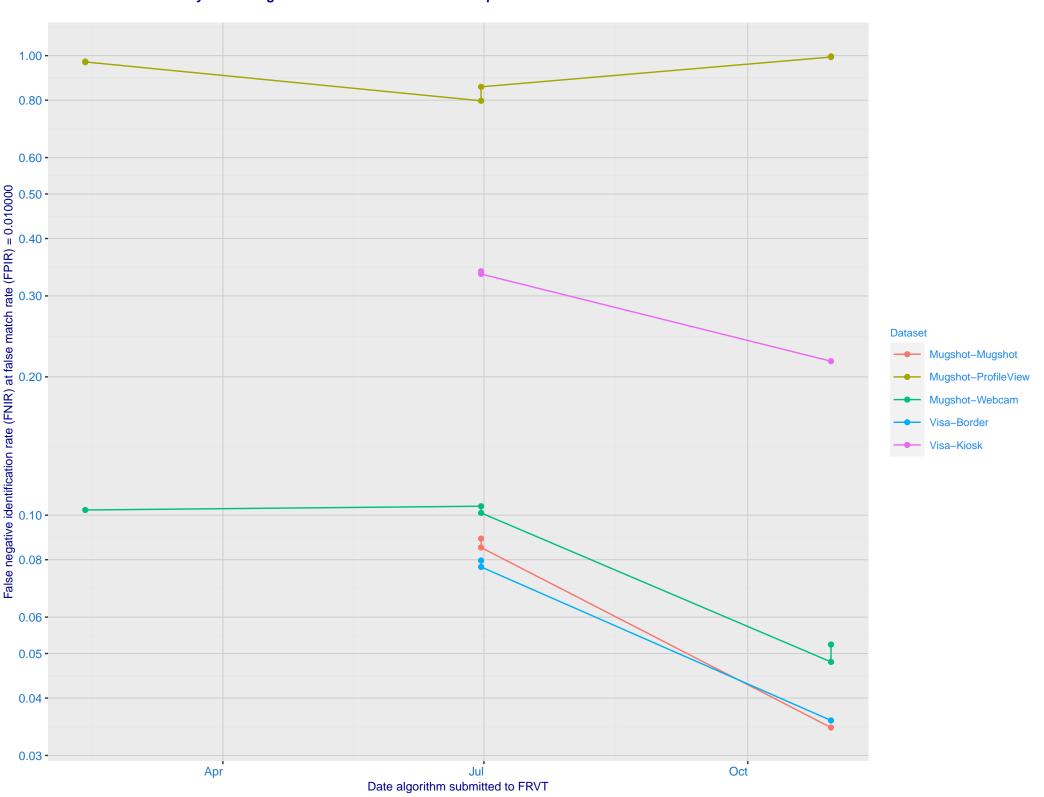
Mugshot profile ranking 56 (out of 209) -- FNIR(1600000, T, L+1) = 0.9763, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 89 (out of 167) -- FNIR(1600000, T, L+1) = 0.1375, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 64 (out of 162) — FNIR(1600000, T, L+1) = 0.4356, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000



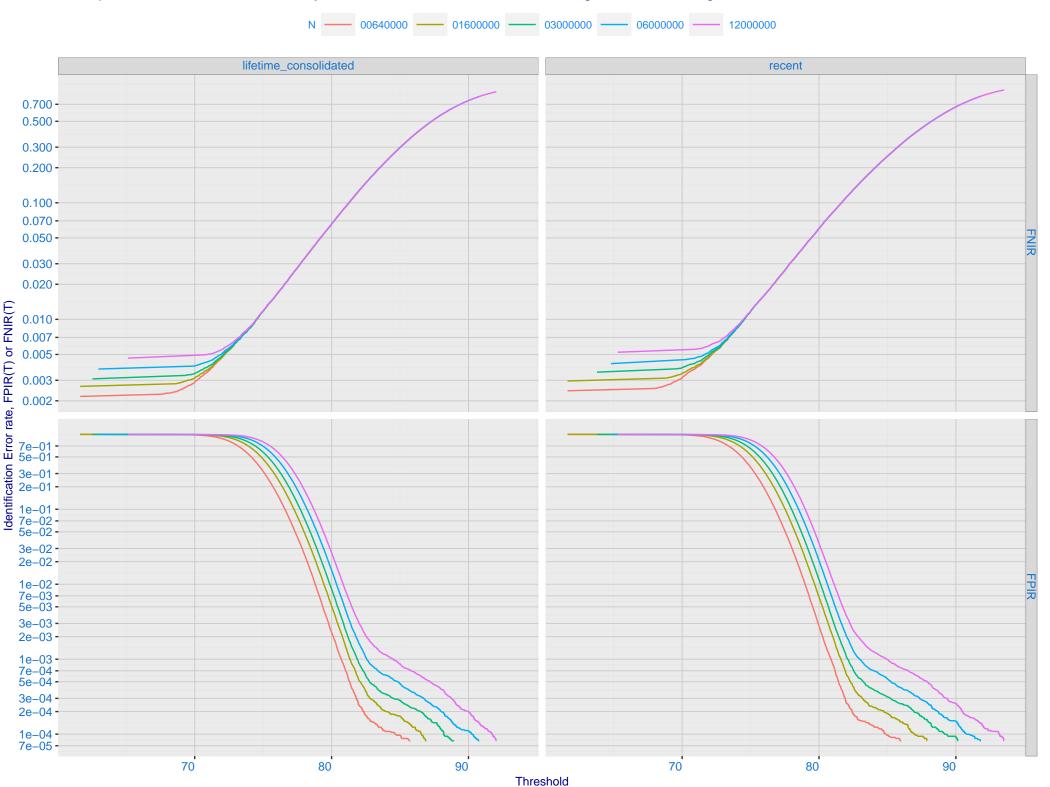
C: Evolution of accuracy for HIK algorithms on three datasets 2018 - present



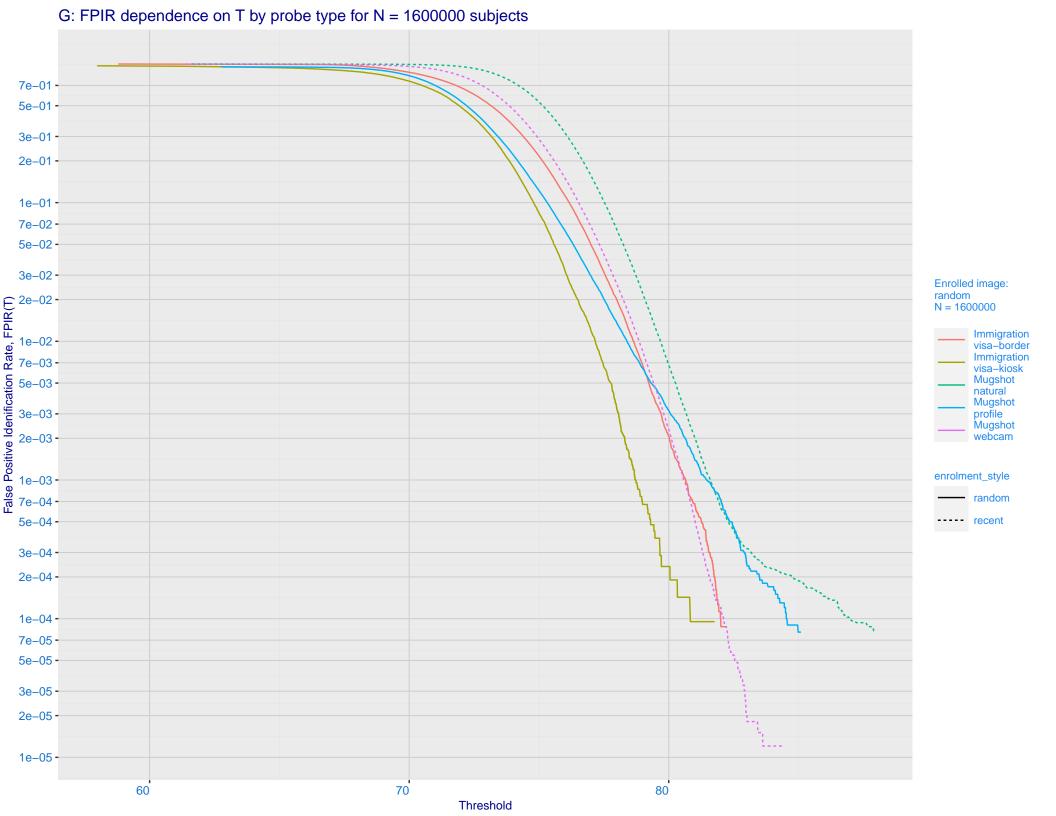
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration Immigration Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.000 - 0.500 - 0.500 - 0.200 -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

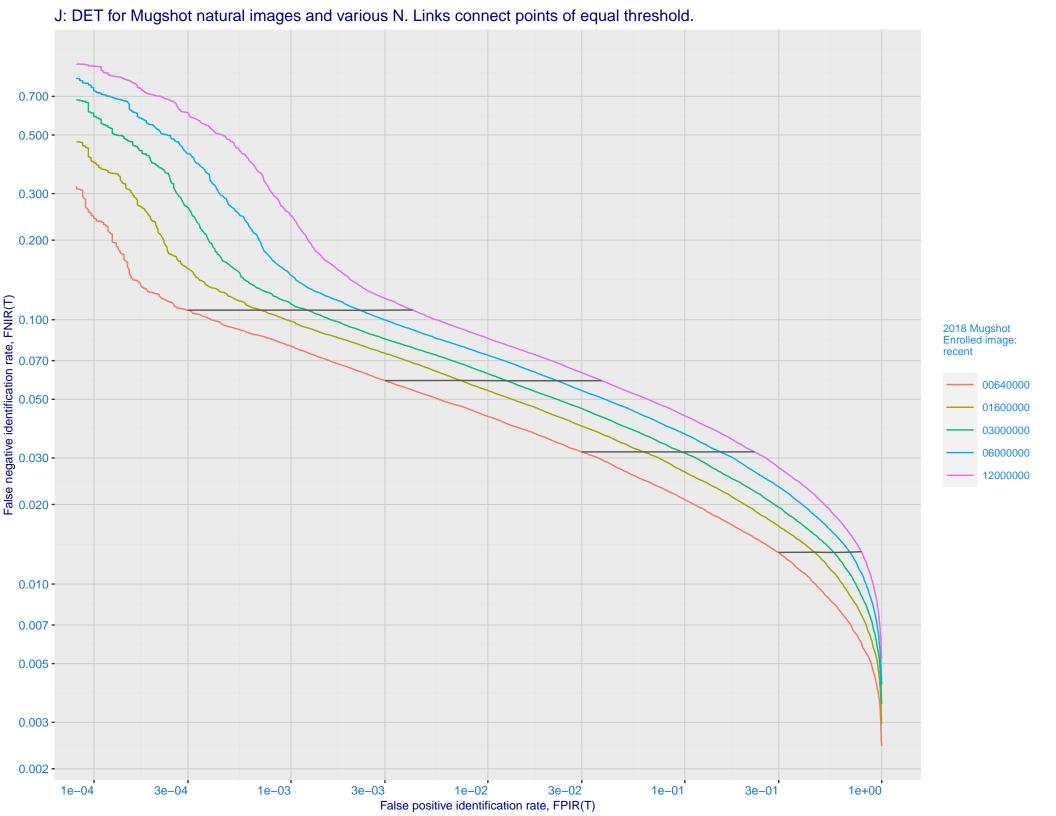
False positive identification rate, FPIR(T)

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

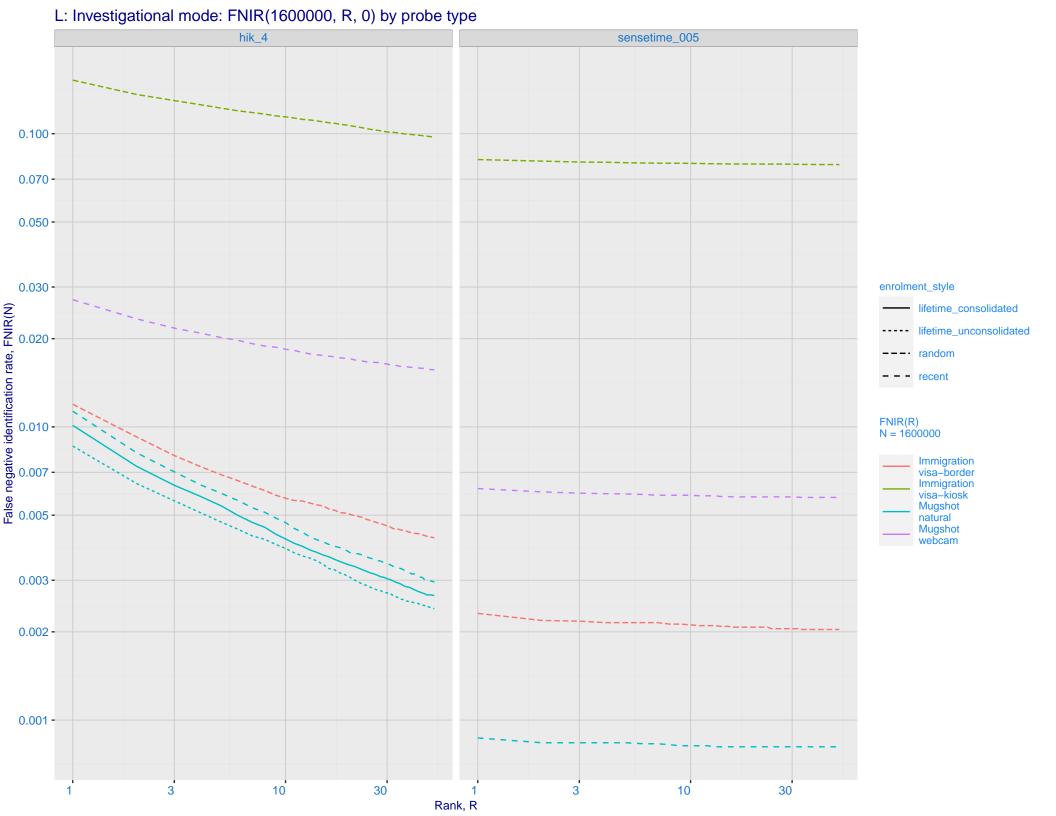


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

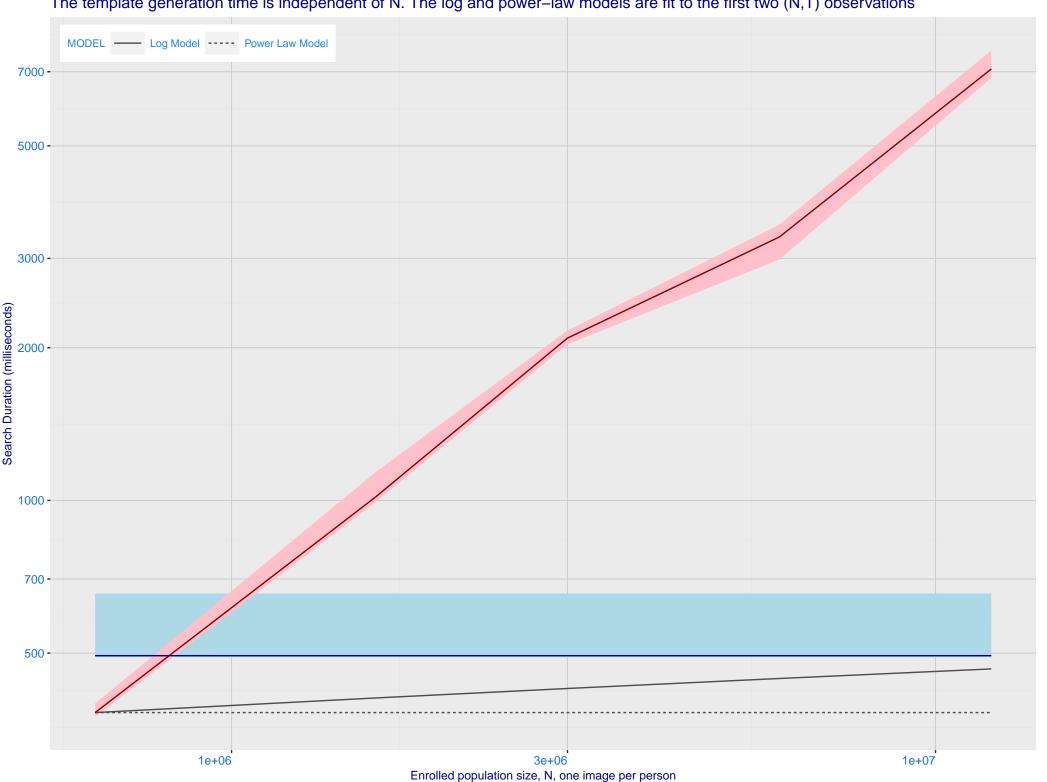




K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Palse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.070 - 0.050 - 0. FNIR@Rank = 1 -- hik_4 sensetime_005 Mugshot Mugshot webcam enrolment_style natural consolidated ---- random --- recent – – unconsolidated 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



M: 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



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



