## A: Datasheet

Algorithm: dahua\_002

Developer: Dahua Technology Co Ltd

Submission Date: 2019\_12\_02

Template size: 2048 bytes

Template time (2.5 percentile): 682 msec

Template time (median): 686 msec

Template time (97.5 percentile): 750 msec

Investigation:

Frontal mugshot ranking 25 (out of 265) — FNIR(1600000, 0, 1) = 0.0018 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 24 (out of 227) -- FNIR(1600000, 0, 1) = 0.0115 vs. lowest 0.0062 from sensetime\_005

Mugshot profile ranking 26 (out of 196) -- FNIR(1600000, 0, 1) = 0.3041 vs. lowest 0.0591 from sensetime\_005

Immigration visa-border ranking 12 (out of 148) -- FNIR(1600000, 0, 1) = 0.0026 vs. lowest 0.0013 from visionlabs\_010

Immigration visa-kiosk ranking 13 (out of 145) -- FNIR(1600000, 0, 1) = 0.0837 vs. lowest 0.0568 from hr\_000

Identification:

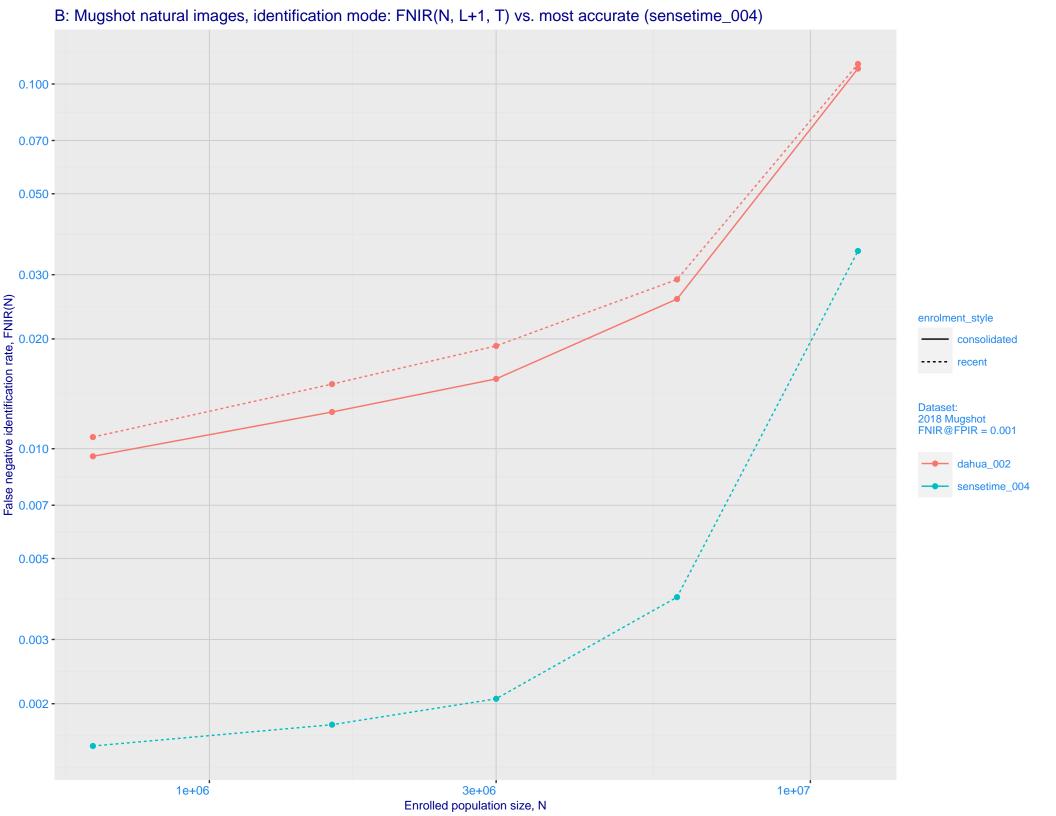
Frontal mugshot ranking 26 (out of 265) -- FNIR(1600000, T, L+1) = 0.0150, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 23 (out of 225) -- FNIR(1600000, T, L+1) = 0.0461, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

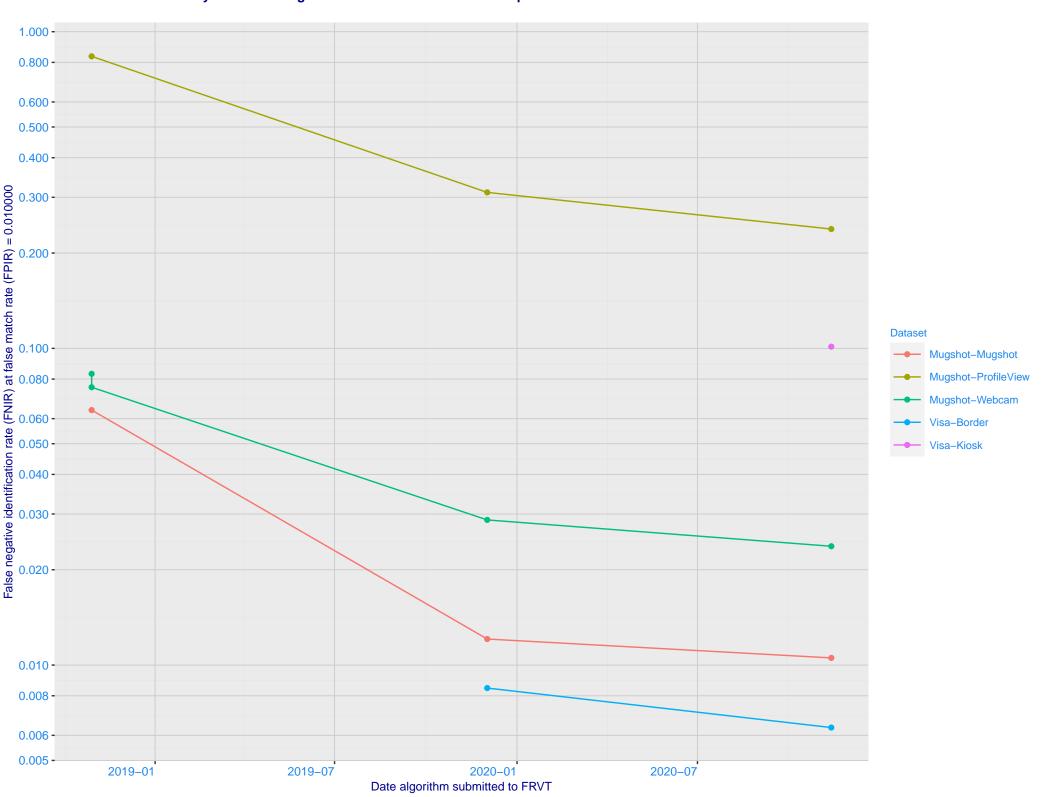
Mugshot profile ranking 13 (out of 195) -- FNIR(1600000, T, L+1) = 0.6382, FPIR=0.001000 vs. lowest 0.1331 from hr\_000

Immigration visa-border ranking 17 (out of 146) -- FNIR(1600000, T, L+1) = 0.0170, FPIR=0.001000 vs. lowest 0.0049 from hr\_000

Immigration visa-kiosk ranking 12 (out of 141) -- FNIR(1600000, T, L+1) = 0.1596, FPIR=0.001000 vs. lowest 0.0996 from hr\_000



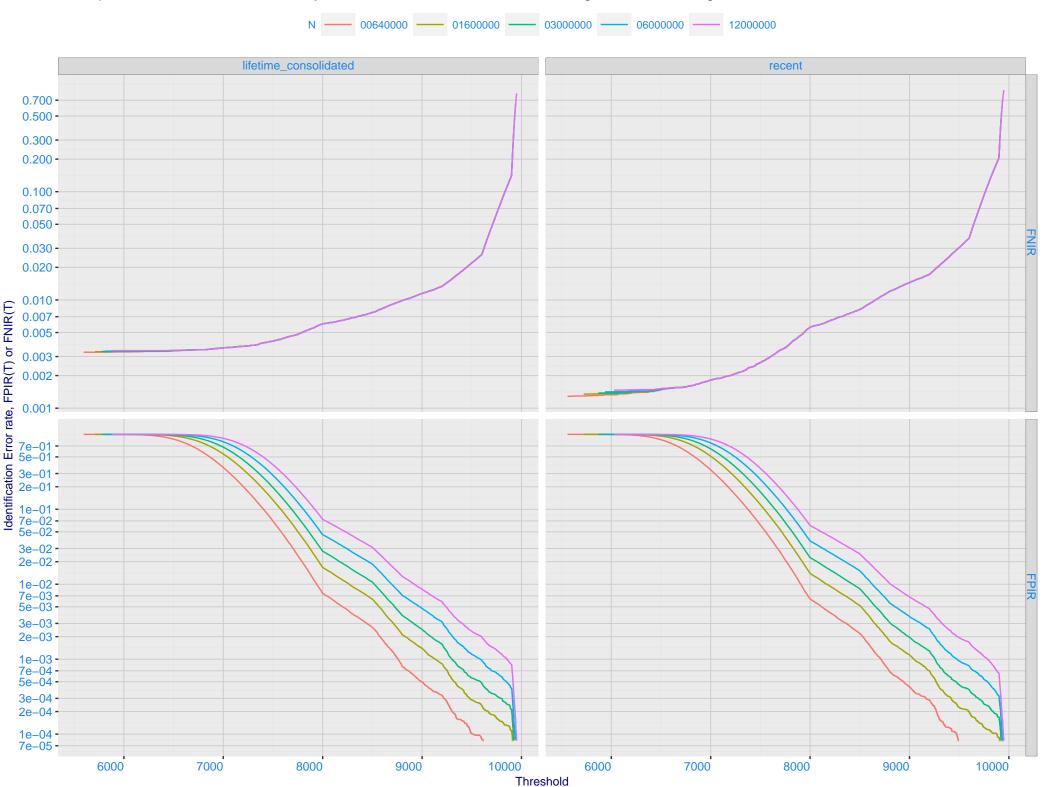
C: Evolution of accuracy for DAHUA algorithms on three datasets 2018 – present



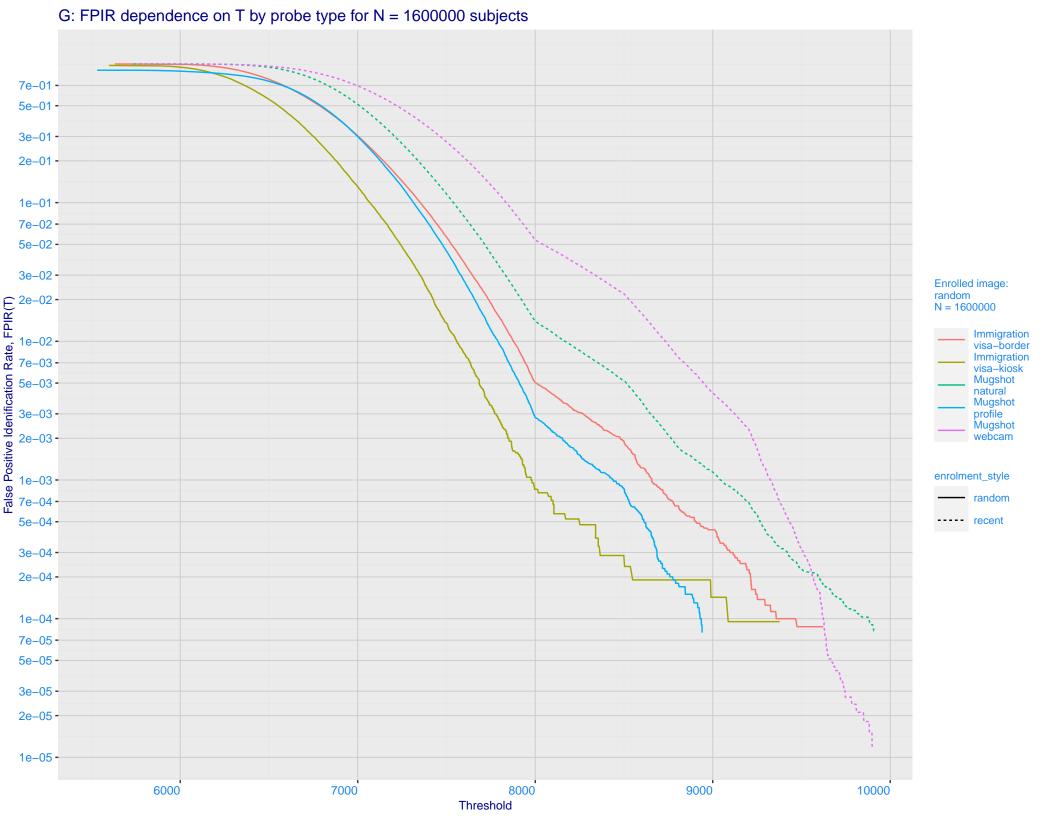
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.0001 - 0.700 - 0.500 - 0.200 - 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 -

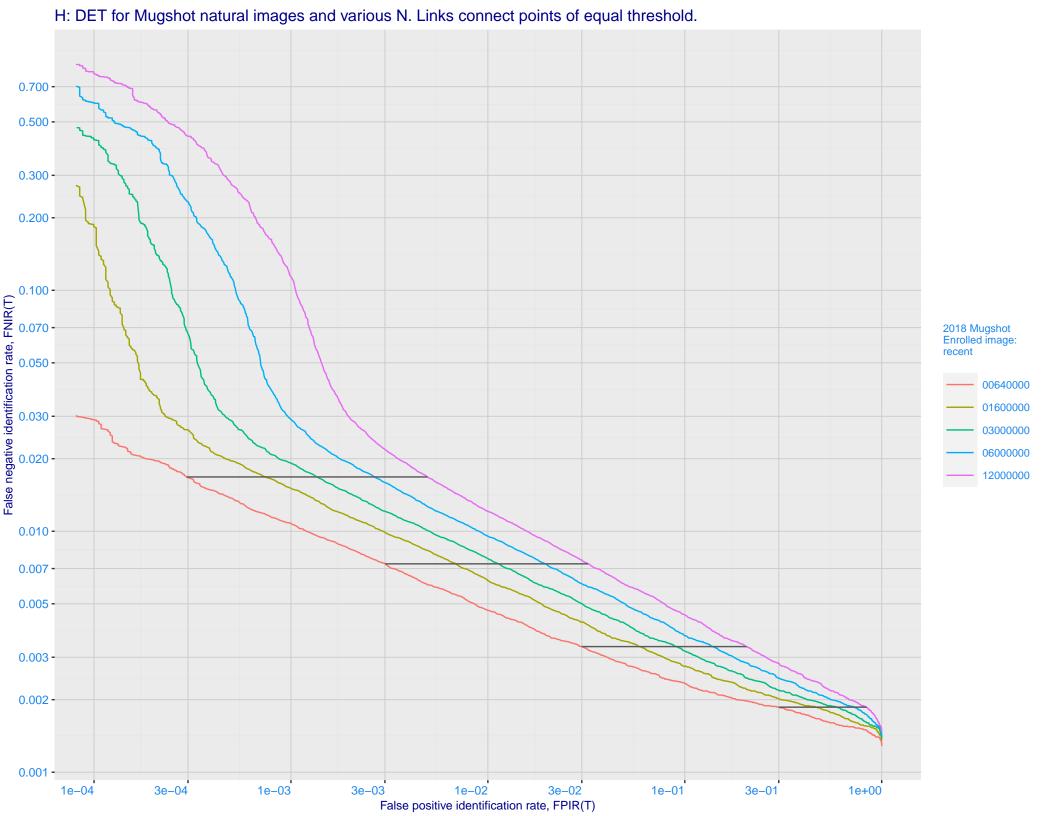
\\\ \e^{-0}\frac{3}{2}e^{-0}\frac{1}{2}e^{-0}\frac{3}{2}e^{-0}\frac{1}{2}e

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)

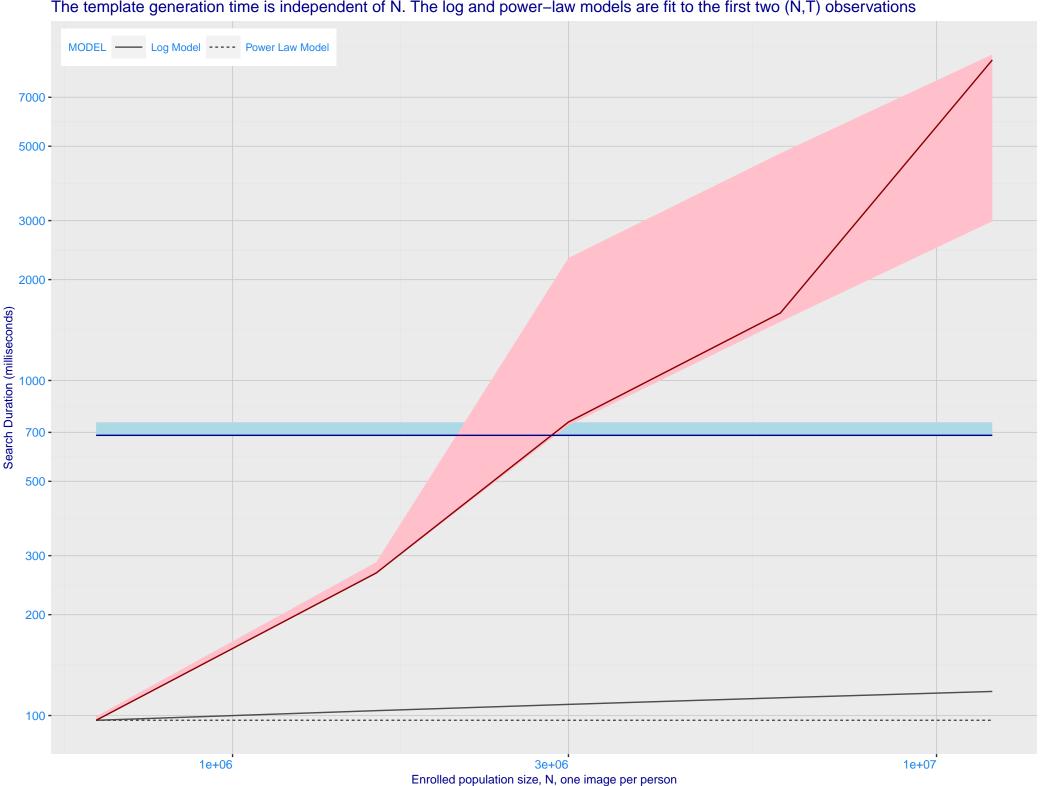




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.050 - 0.030 - 0. FNIR@Rank = 1 -- dahua\_002 sensetime\_005 Mugshot Mugshot webcam natural enrolment\_style consolidated ---- random --- recent 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 dahua\_002 sensetime\_005 0.100 -0.070 -0.050 -0.030 -0.020 enrolment\_style False negative identification rate, FNIR(N) 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



