## A: Datasheet

Algorithm: vocord\_5

Developer: Vocord

Submission Date: 2018\_10\_30

Template size: 768 bytes

Template time (2.5 percentile): 778 msec

Template time (median): 781 msec

Template time (97.5 percentile): 1210 msec

Investigation:

Frontal mugshot ranking 115 (out of 279) -- FNIR(1600000, 0, 1) = 0.0070 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 104 (out of 241) -- FNIR(1600000, 0, 1) = 0.0232 vs. lowest 0.0062 from sensetime\_005

Mugshot profile ranking 110 (out of 210) — FNIR(1600000, 0, 1) = 0.8121 vs. lowest 0.0587 from xforwardai\_002

Immigration visa-border ranking 110 (out of 168) -- FNIR(1600000, 0, 1) = 0.0548 vs. lowest 0.0013 from visionlabs\_010

Immigration visa-kiosk ranking 91 (out of 165) -- FNIR(1600000, 0, 1) = 0.2056 vs. lowest 0.0568 from cloudwalk\_hr\_000

Identification:

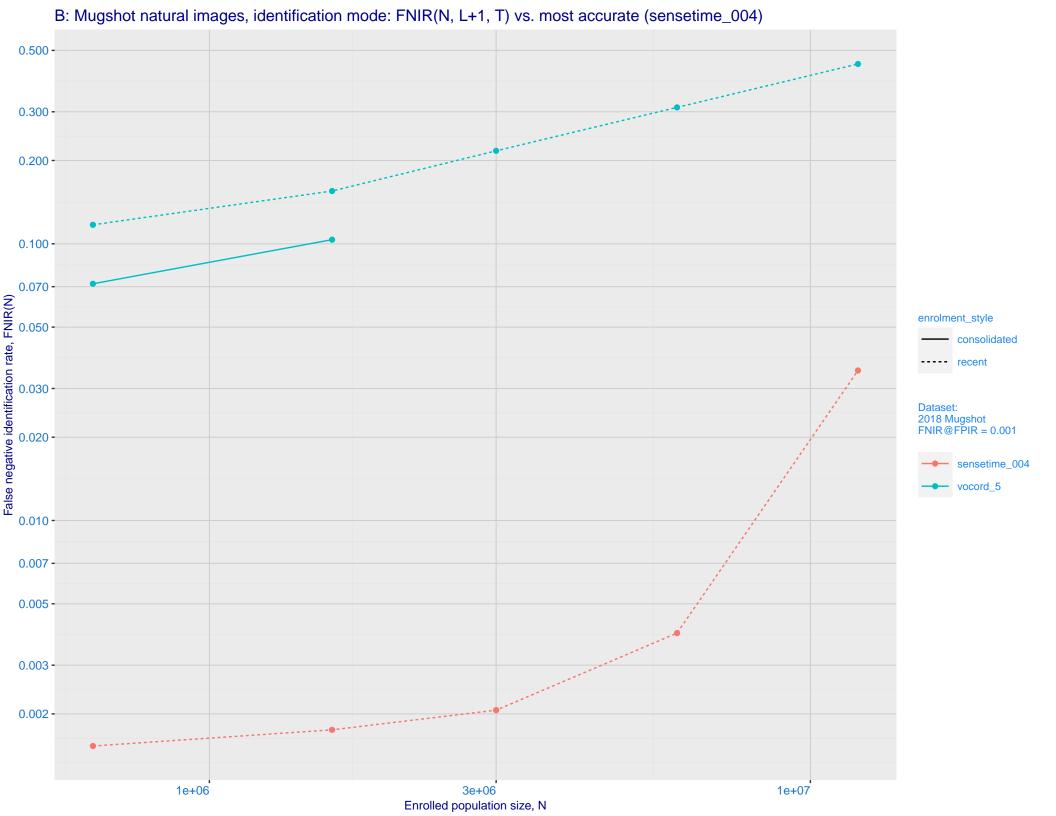
Frontal mugshot ranking 171 (out of 279) -- FNIR(1600000, T, L+1) = 0.1551, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 102 (out of 236) -- FNIR(1600000, T, L+1) = 0.1295, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

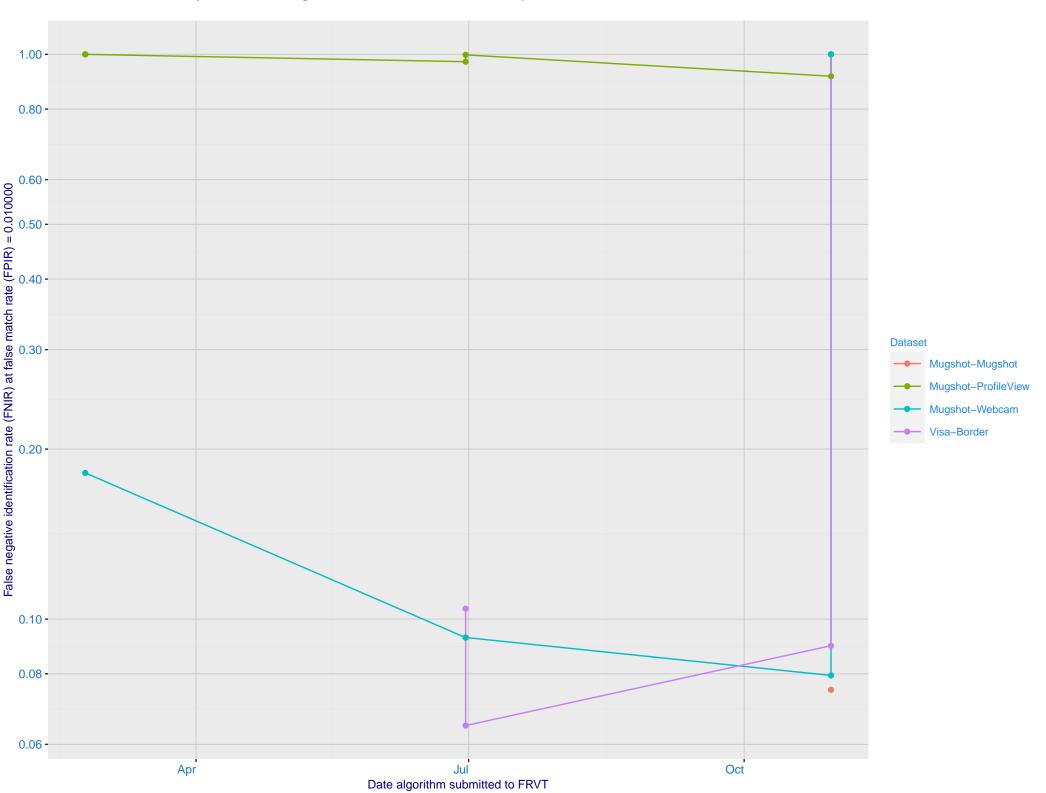
Mugshot profile ranking 116 (out of 209) -- FNIR(1600000, T, L+1) = 0.9973, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk\_hr\_000

Immigration visa-border ranking 90 (out of 167) -- FNIR(1600000, T, L+1) = 0.1380, FPIR=0.001000 vs. lowest 0.0047 from idemia\_008

Immigration visa-kiosk ranking 58 (out of 162) -- FNIR(1600000, T, L+1) = 0.3835, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk\_hr\_000



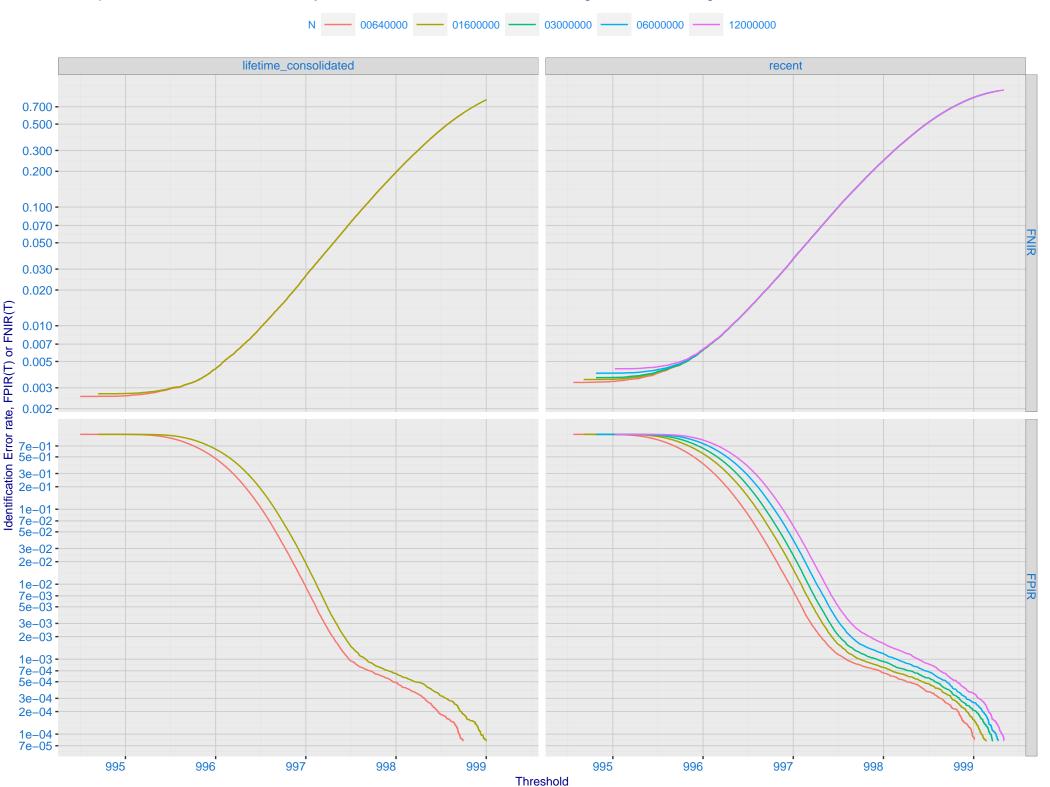
C: Evolution of accuracy for VOCORD algorithms on three datasets 2018 – present



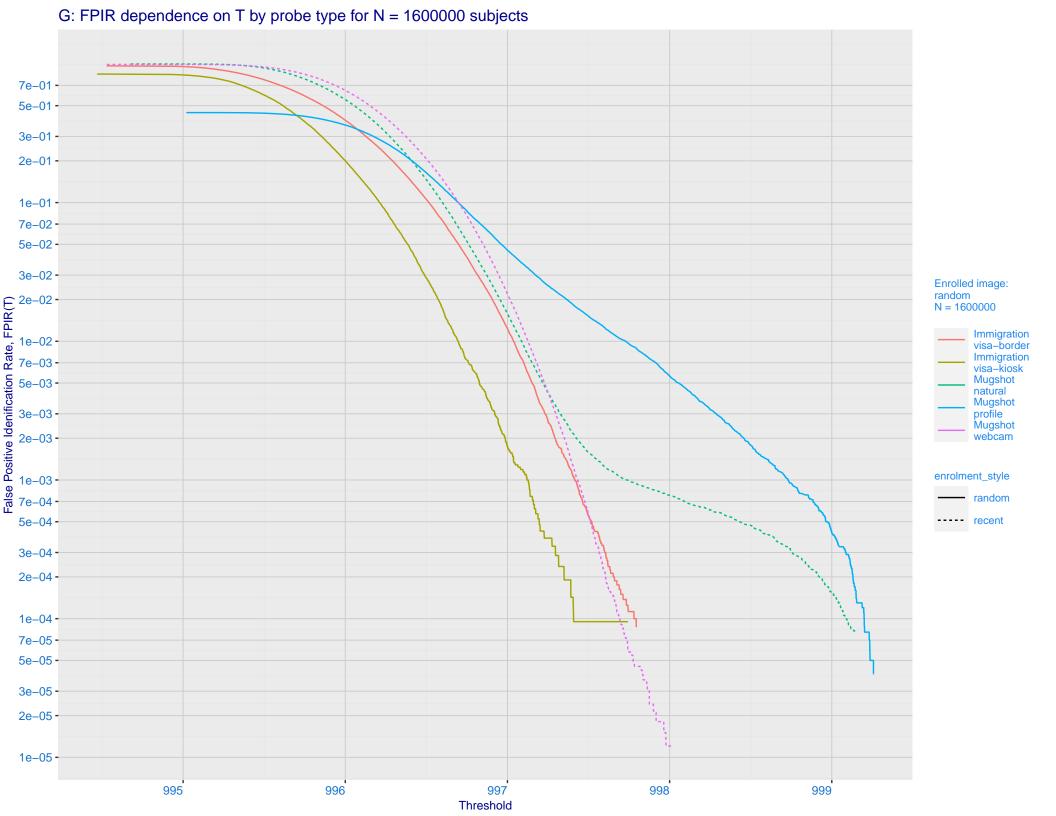
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 sensetime 004 0.050 -0.030 -0.020 -0.010 -0.007 - 0.005 - 0.005 - 0.002 - 0.001 - 0.001 - 0.700 - 0.500 - 0.200 enrolment\_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.100 -0.070 -0.050 vocord 5 0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

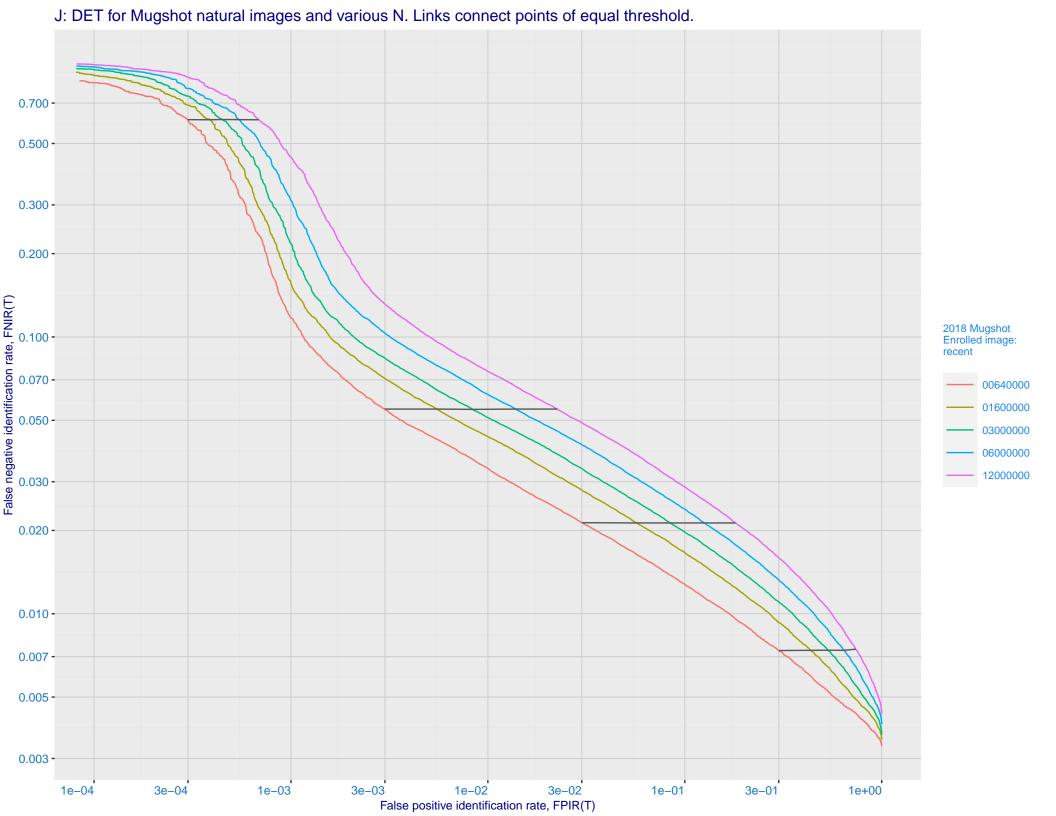
\\\ \e^{-0}\frac{3}{2}e^{-0}\frac{1}{2}e^{-0}\frac{3}{2}e^{-0}\frac{1}{2}e

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)

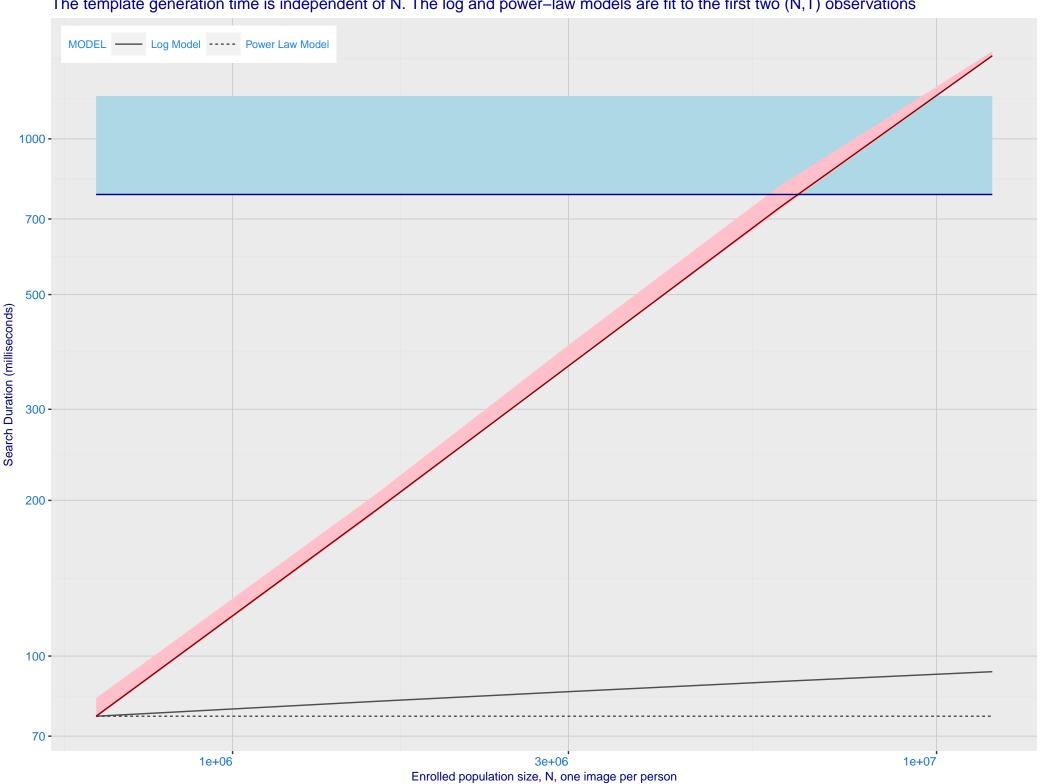




K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Ealse negative identification rate, FNIR(N) 0.003 - 0.001 - 0.001 - 0.100 - 0.070 - 0. enrolment\_style consolidated ---- random --- recent Mugshot Mugshot webcam natural FNIR@Rank = 1 sensetime\_005 vocord\_5 0.050 -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

L: Investigational mode: FNIR(1600000, R, 0) by probe type sensetime\_005 vocord\_5 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 0.005 webcam 0.003 -0.002 -0.001 -3 10 30 3 10 30 Rank, R

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



