## A: Datasheet

Algorithm: cognitec\_1

Developer: Cognitec Systems GmbH

Submission Date: 2018\_06\_21

Template size: 2052 bytes

Template time (2.5 percentile): 198 msec

Template time (median): 201 msec

Template time (97.5 percentile): 216 msec

Investigation:

Frontal mugshot ranking 132 (out of 259) -- FNIR(1600000, 0, 1) = 0.0117 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 112 (out of 221) -- FNIR(1600000, 0, 1) = 0.0343 vs. lowest 0.0062 from sensetime\_005

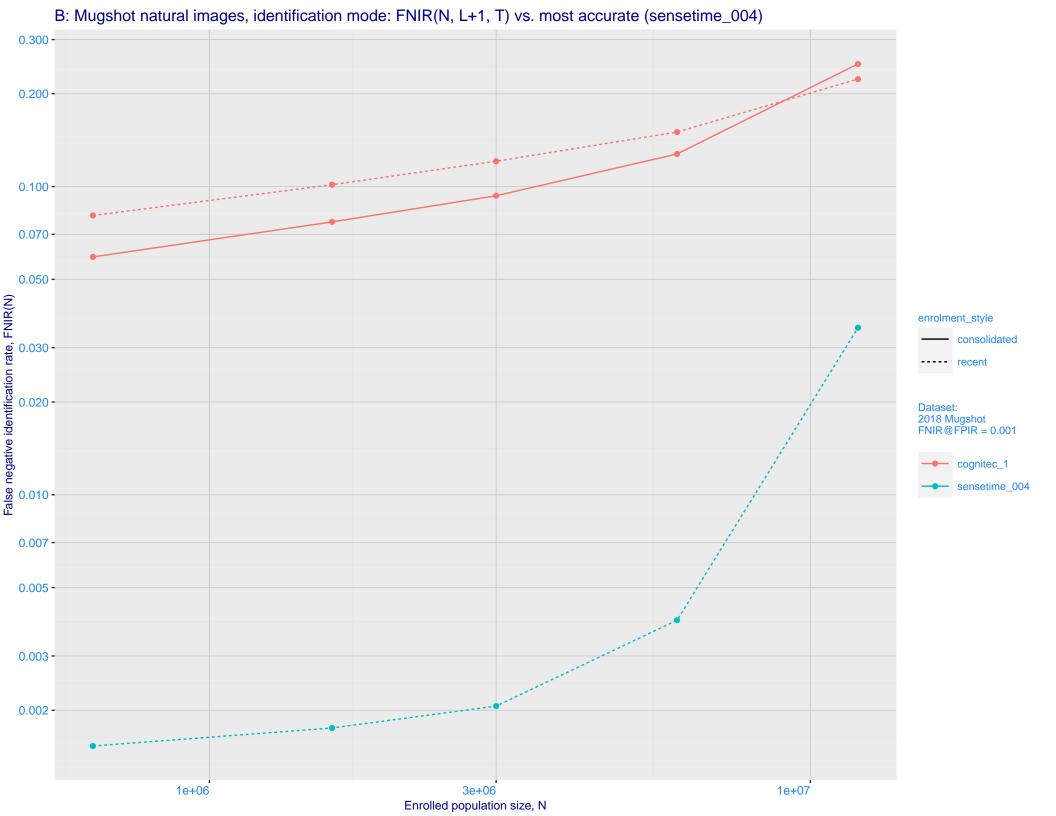
Mugshot profile ranking 144 (out of 190) -- FNIR(1600000, 0, 1) = 0.9578 vs. lowest 0.0591 from sensetime\_005

Identification:

Frontal mugshot ranking 128 (out of 259) -- FNIR(1600000, T, L+1) = 0.1014, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 131 (out of 219) -- FNIR(1600000, T, L+1) = 0.2296, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

Mugshot profile ranking 186 (out of 189) -- FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.1733 from sensetime\_005



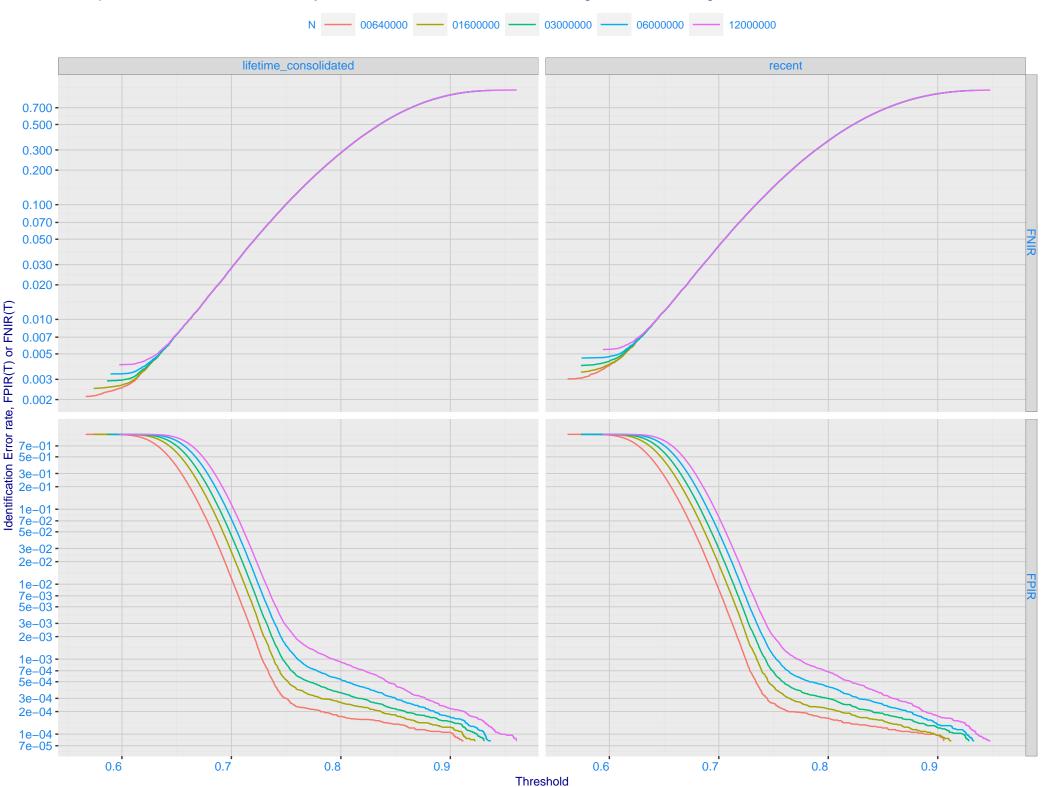
C: Evolution of accuracy for COGNITEC algorithms on three datasets 2018 – present



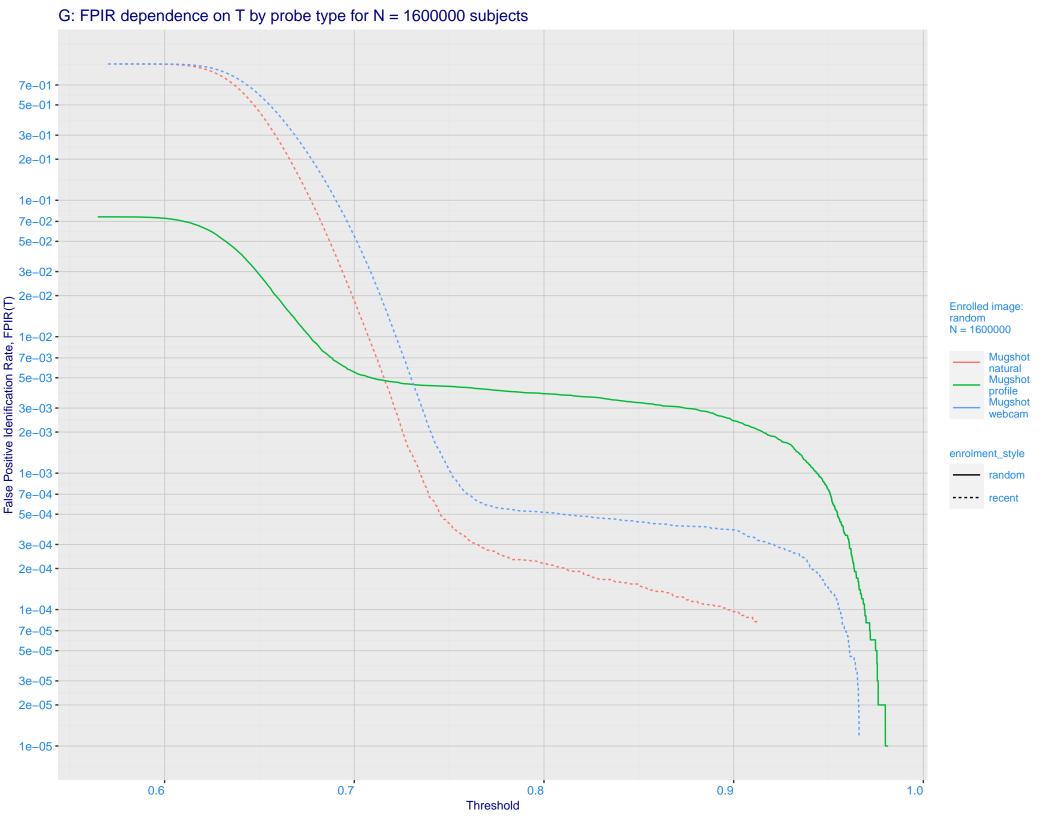
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration** Immigration Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 - 0.005 - 0.005 - 0.002 - 0.001 - 0.001 - 0.700 - 0.500 - 0.200 enrolment\_style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

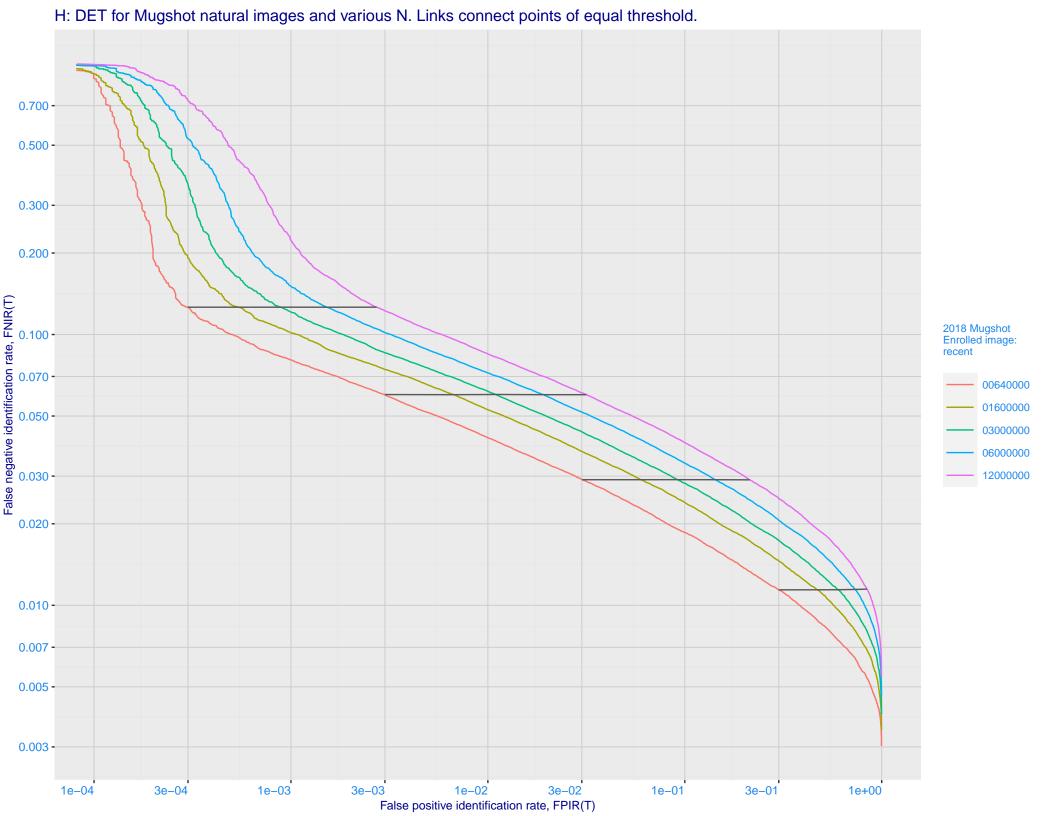
False positive identification rate, FPIR(T)

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

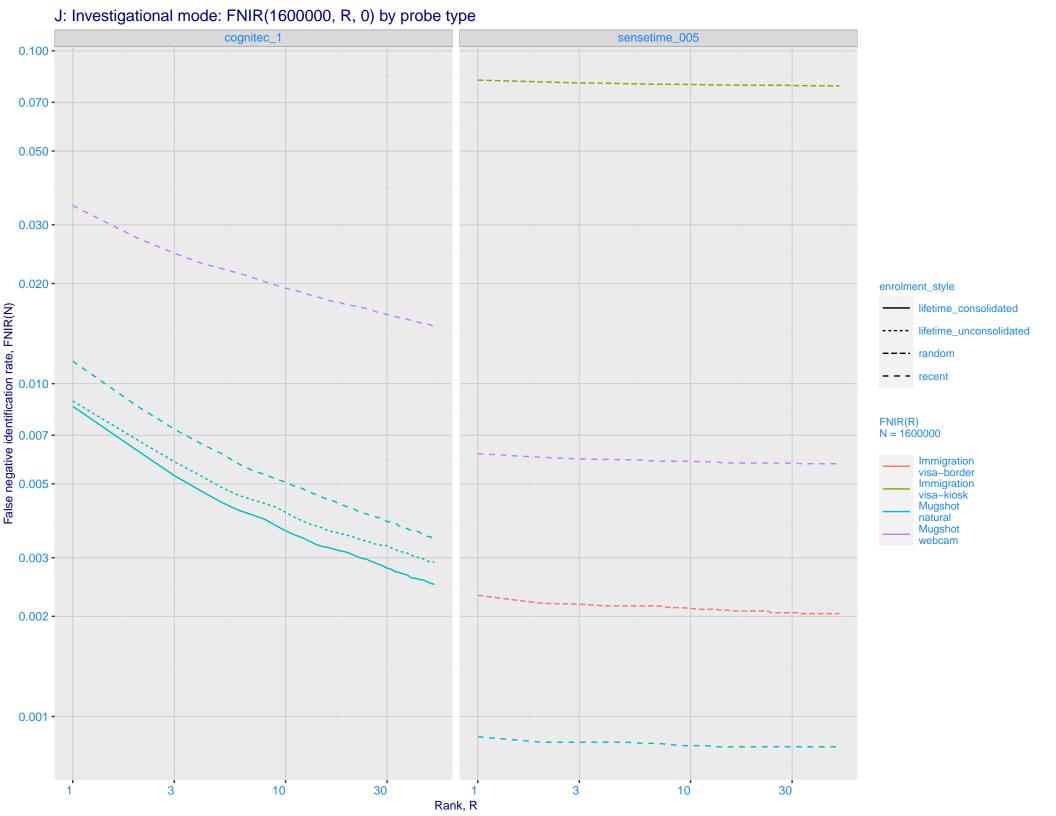


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

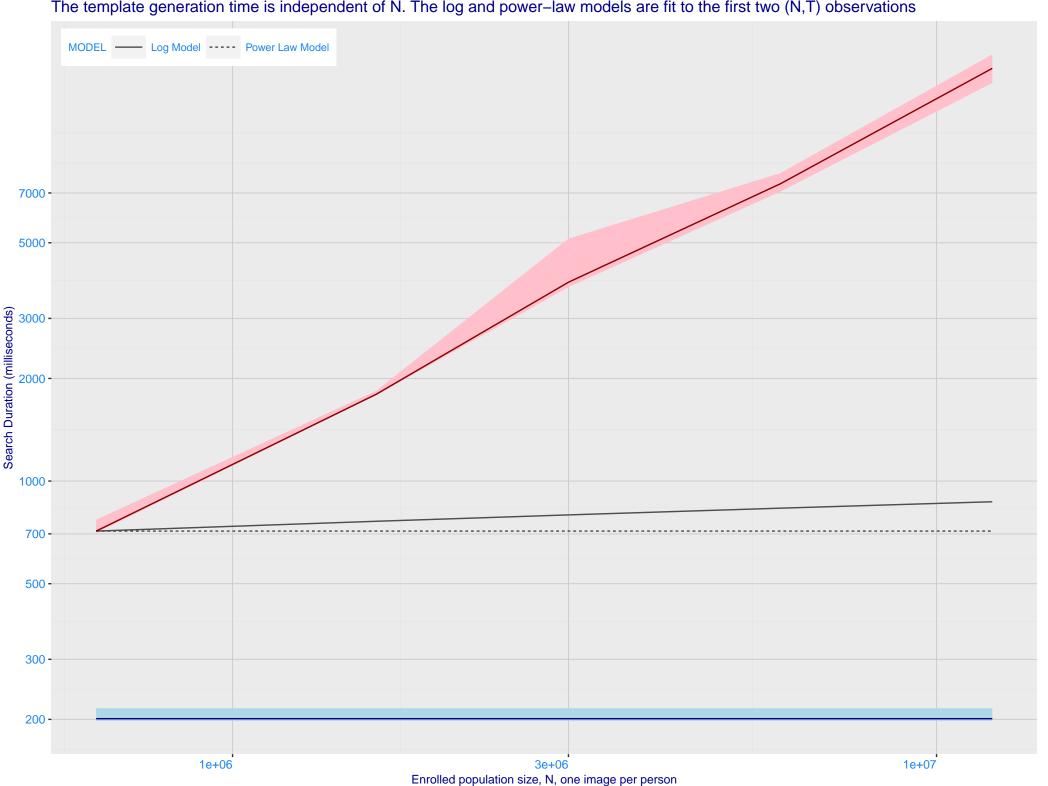




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Palse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.050 - 0.030 - 0. enrolment\_style consolidated ---- random --- recent - - - unconsolidated Mugshot Mugshot webcam natural FNIR@Rank = 1 cognitec\_1 - 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



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



