## A: Datasheet

Algorithm: cogent\_0

Developer: Thales

Submission Date: 2018\_06\_20

Template size: 525 bytes

Template time (2.5 percentile): 541 msec

Template time (median): 550 msec

Template time (97.5 percentile): 579 msec

Investigation:

Frontal mugshot ranking 124 (out of 259) -- FNIR(1600000, 0, 1) = 0.0105 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 136 (out of 221) -- FNIR(1600000, 0, 1) = 0.0461 vs. lowest 0.0062 from sensetime\_005

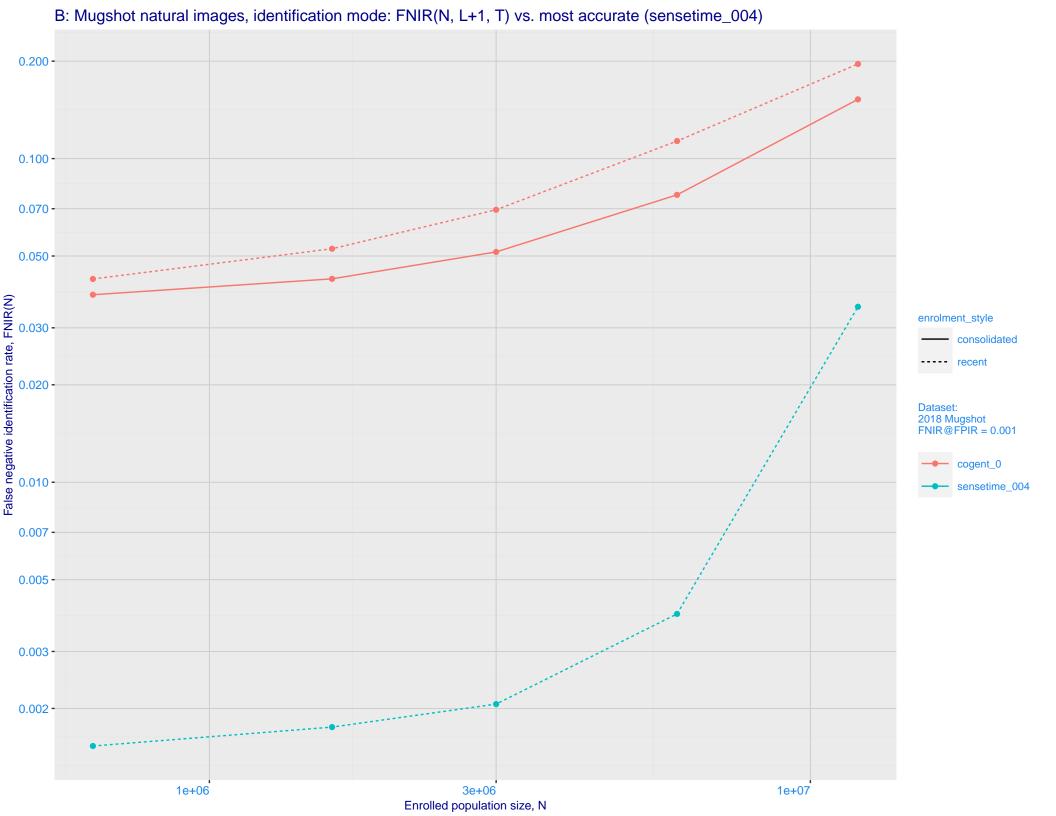
Mugshot profile ranking 154 (out of 190) -- FNIR(1600000, 0, 1) = 0.9653 vs. lowest 0.0591 from sensetime\_005

Identification:

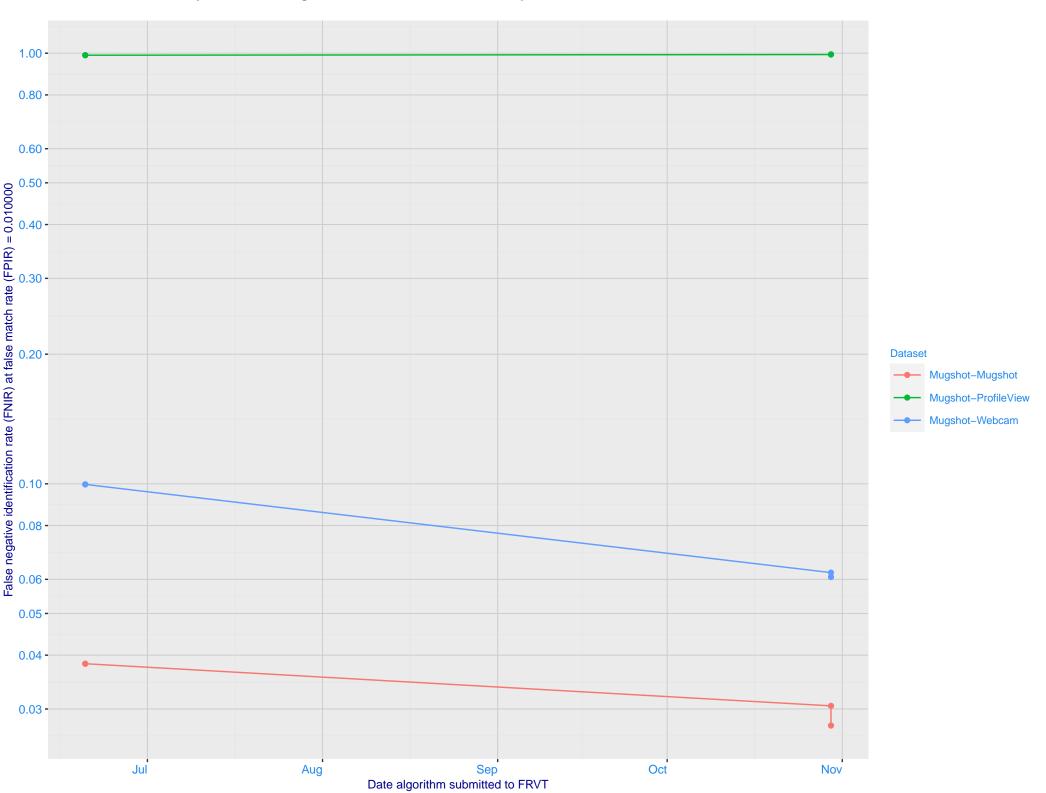
Frontal mugshot ranking 84 (out of 259) -- FNIR(1600000, T, L+1) = 0.0527, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 94 (out of 219) -- FNIR(1600000, T, L+1) = 0.1402, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

Mugshot profile ranking 96 (out of 189) -- FNIR(1600000, T, L+1) = 0.9949, FPIR=0.001000 vs. lowest 0.1733 from sensetime\_005



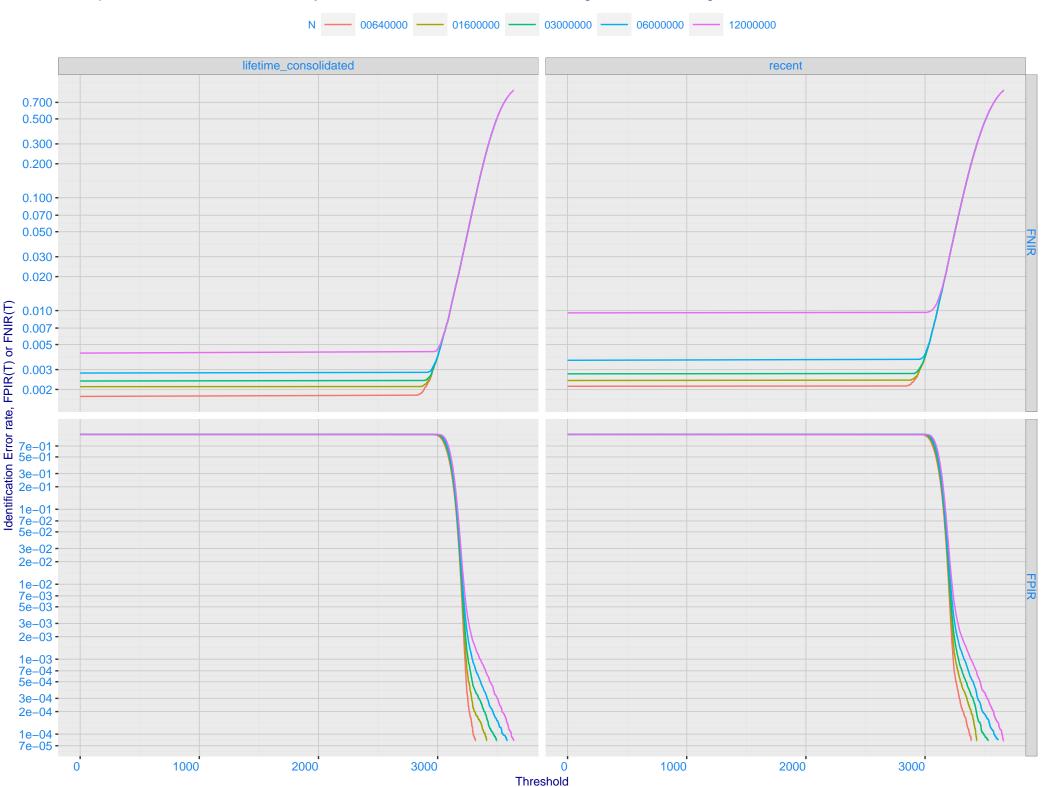
C: Evolution of accuracy for COGENT algorithms on three datasets 2018 – present



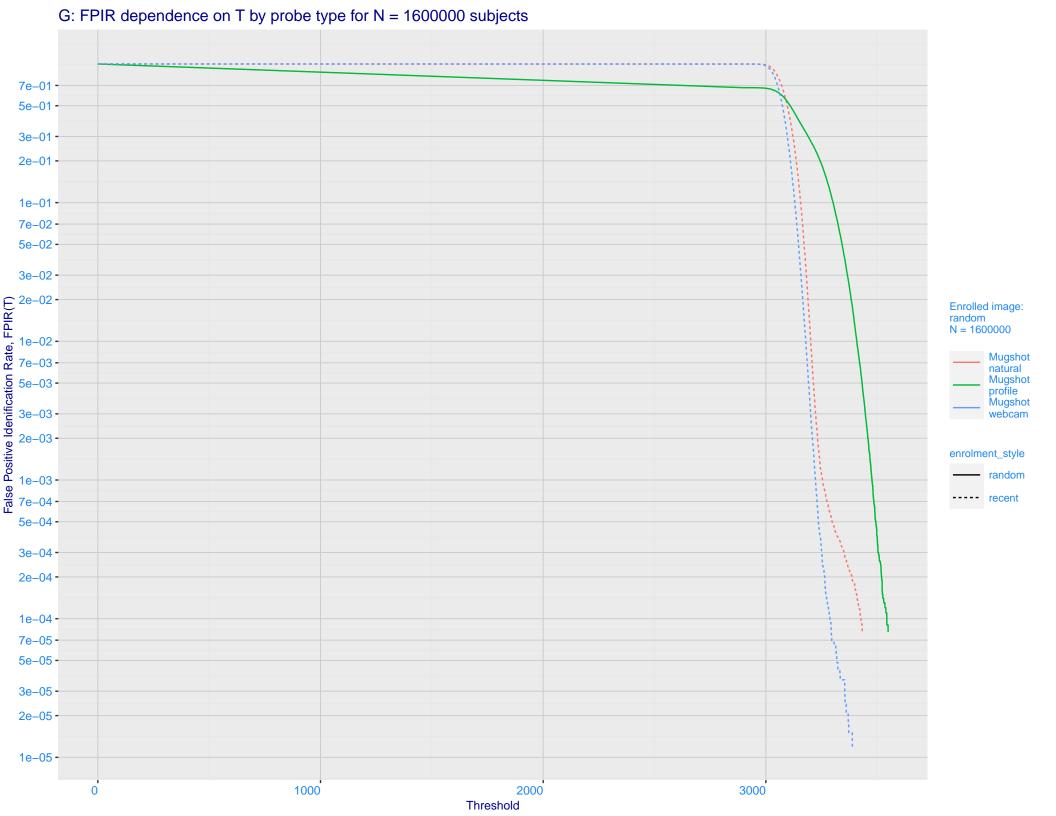
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration Immigration Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.0001 - 0.700 - 0.500 - 0.200 - 0.100 - 0 enrolment\_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE 0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

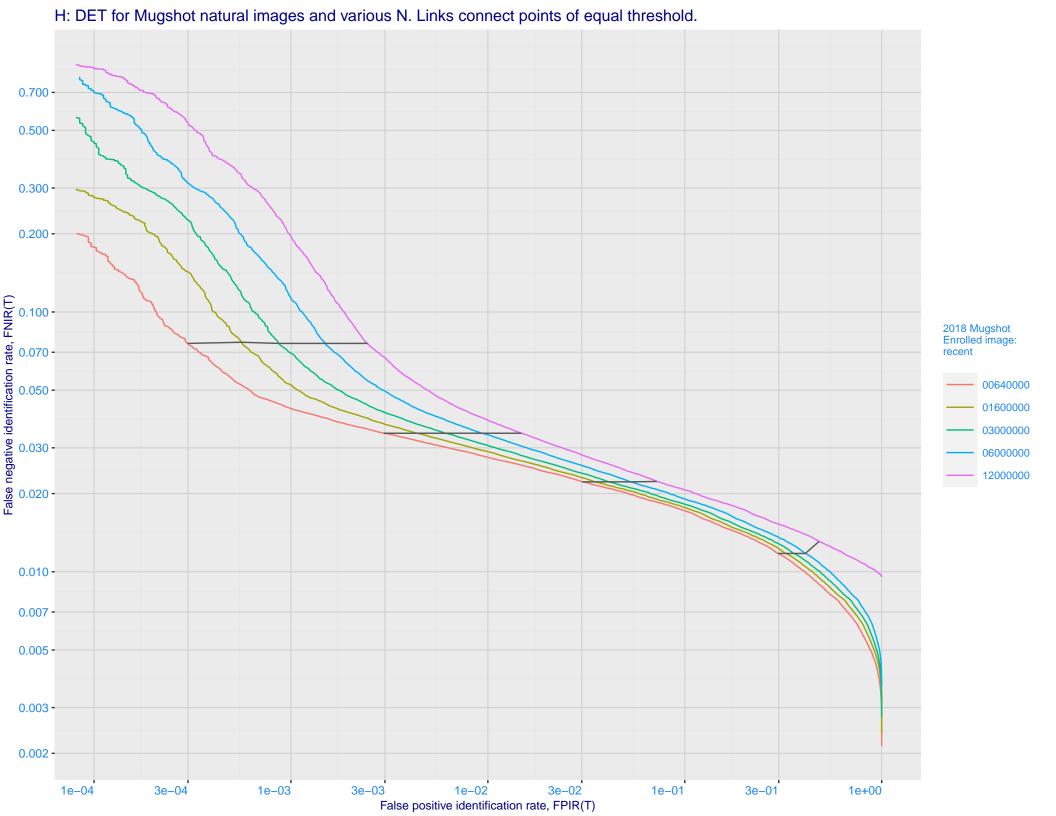
False positive identification rate, FPIR(T)

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

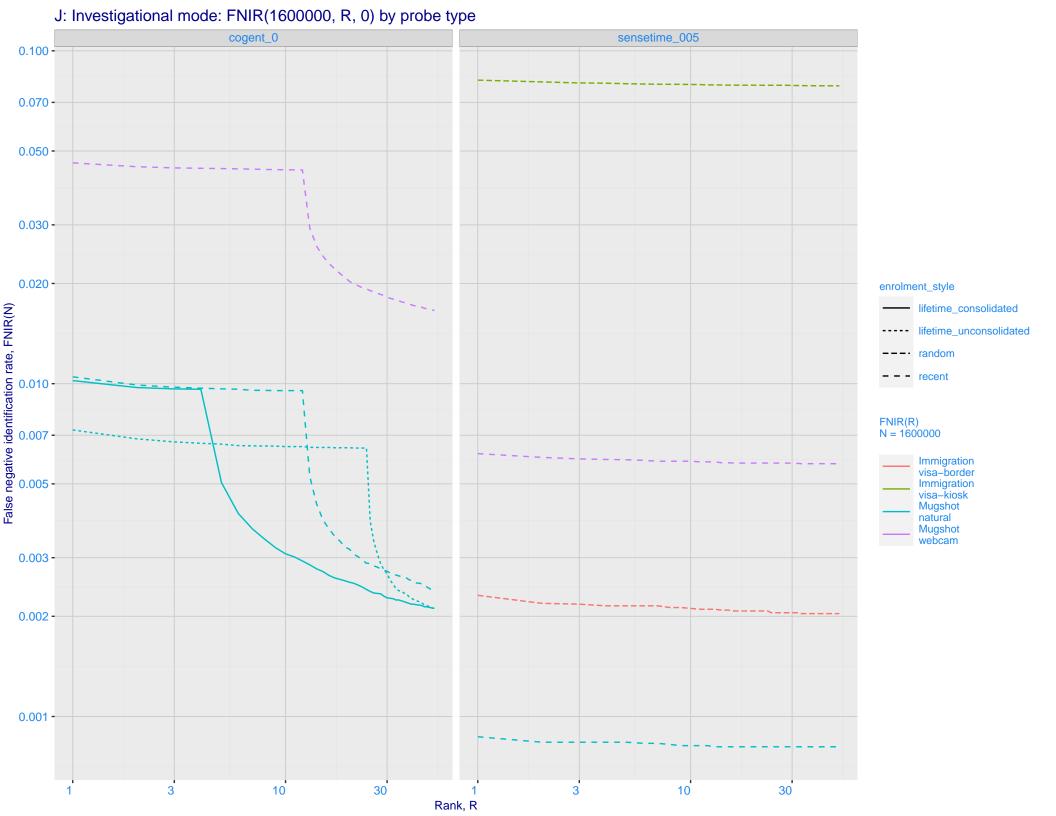


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam 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 -3e-02 1e-05 3e-05 1e-04 3e-04 1e-03 3e-03 1e-02 1e-01 3e-01 False Positive Idenification Rate, FPIR(T)

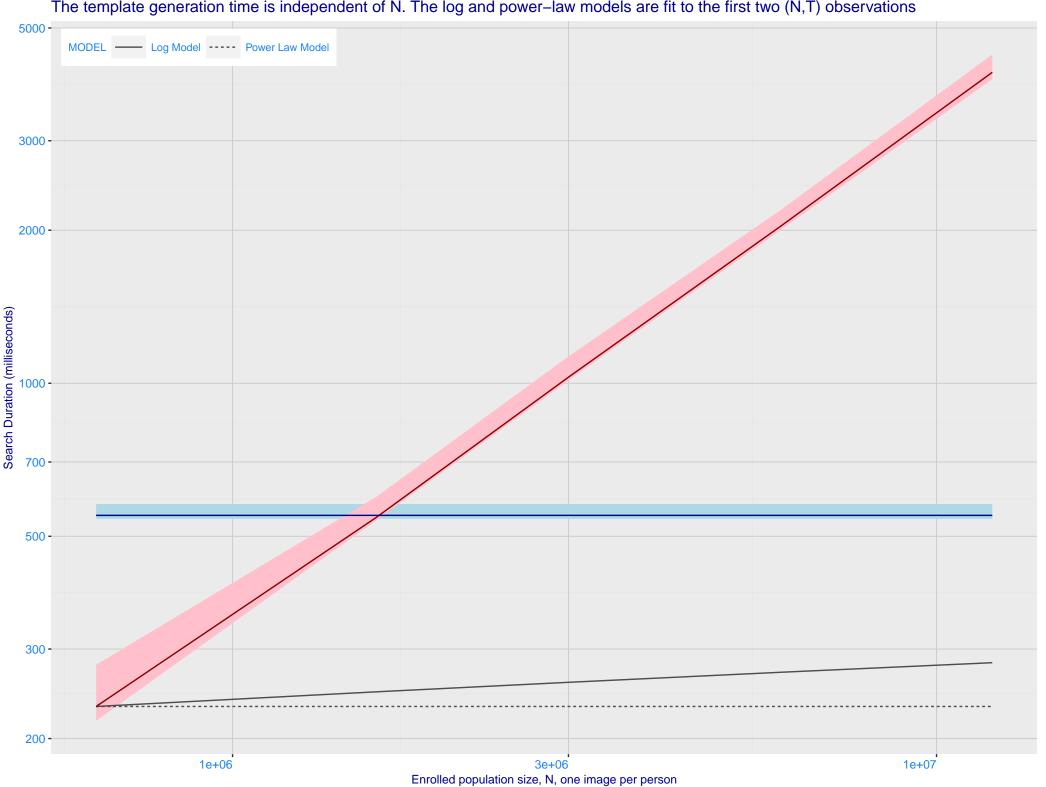




I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Palse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.050 - 0.030 - 0. FNIR@Rank = 1 -- cogent\_0 sensetime\_005 Mugshot Mugshot webcam enrolment\_style natural consolidated ---- random --- recent – – unconsolidated 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



