## A: Datasheet

Algorithm: cogent\_2

Developer: Thales

Submission Date: 2018\_10\_30

Template size: 1043 bytes

Template time (2.5 percentile): 941 msec

Template time (median): 946 msec

Template time (97.5 percentile): 1485 msec

Investigation:

Frontal mugshot ranking 57 (out of 259) -- FNIR(1600000, 0, 1) = 0.0036 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 68 (out of 221) -- FNIR(1600000, 0, 1) = 0.0203 vs. lowest 0.0062 from sensetime\_005

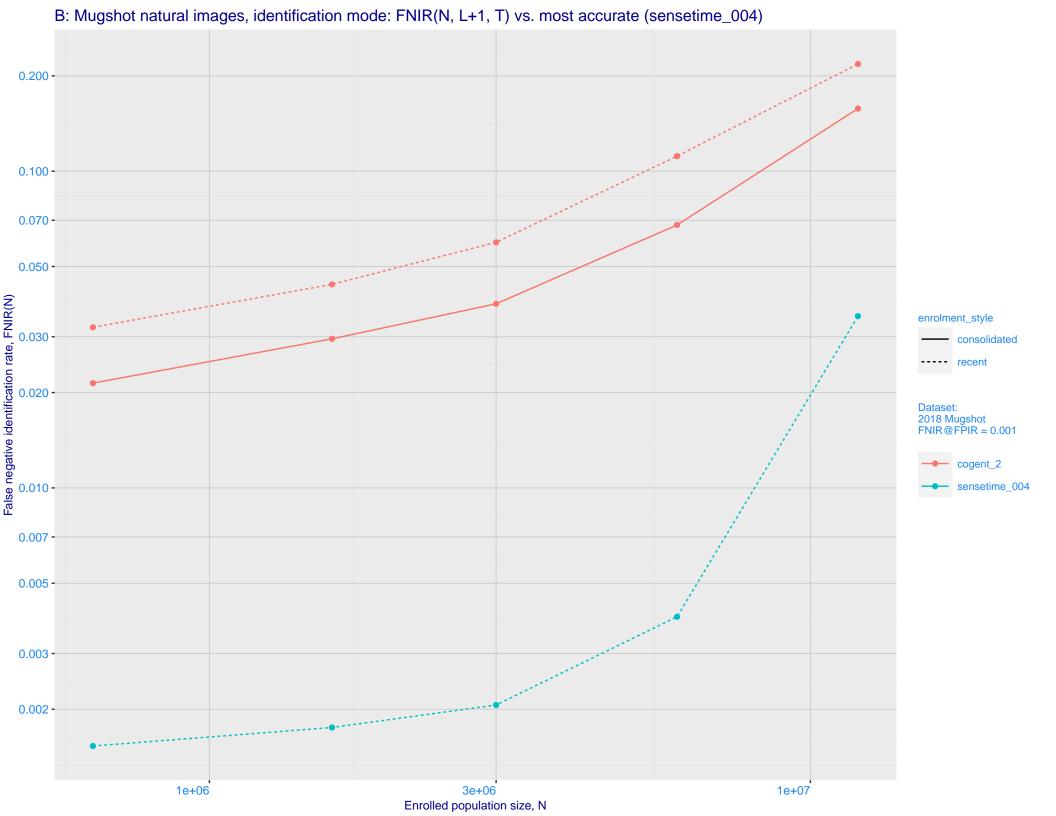
Mugshot profile ranking 112 (out of 190) -- FNIR(1600000, 0, 1) = 0.9251 vs. lowest 0.0591 from sensetime\_005

Identification:

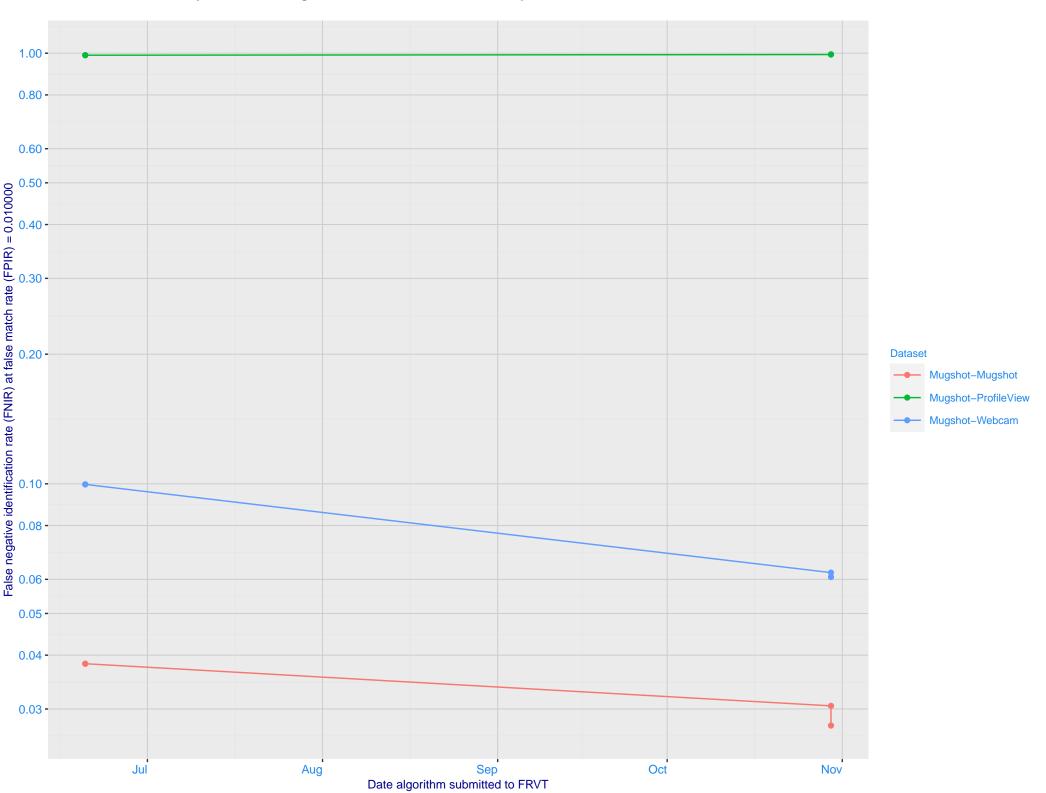
Frontal mugshot ranking 64 (out of 259) -- FNIR(1600000, T, L+1) = 0.0439, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 59 (out of 219) -- FNIR(1600000, T, L+1) = 0.0976, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

Mugshot profile ranking 108 (out of 189) -- FNIR(1600000, T, L+1) = 0.9977, FPIR=0.001000 vs. lowest 0.1733 from sensetime\_005



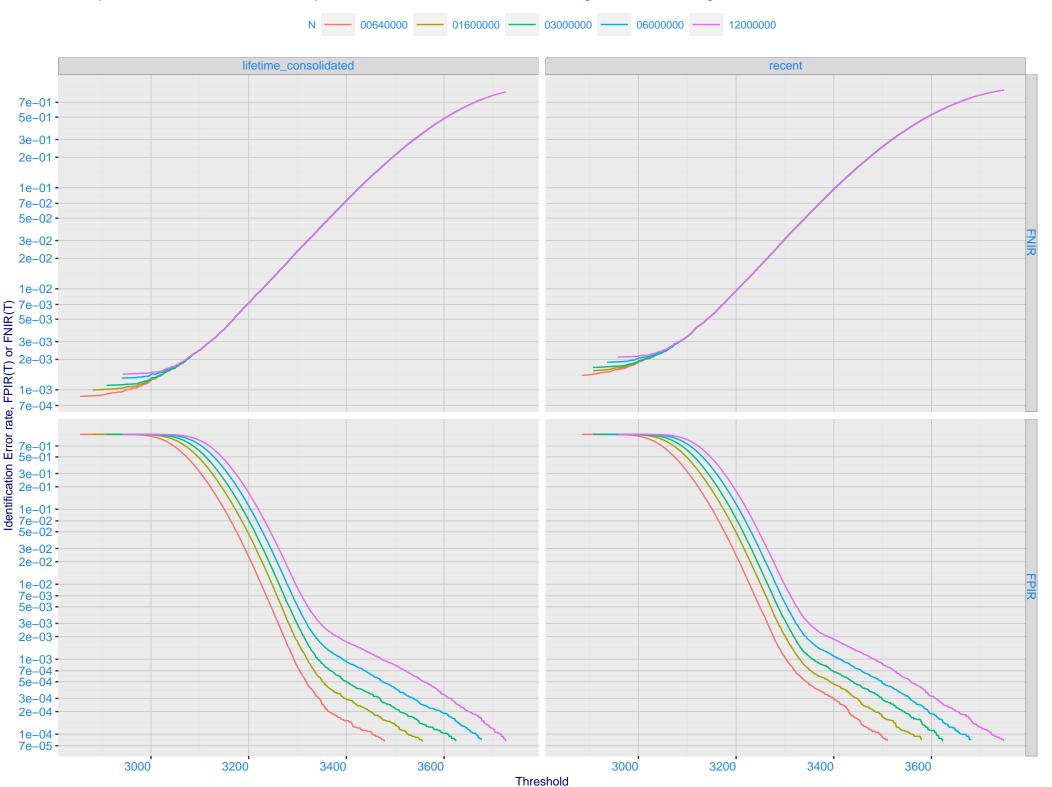
C: Evolution of accuracy for COGENT algorithms on three datasets 2018 – present



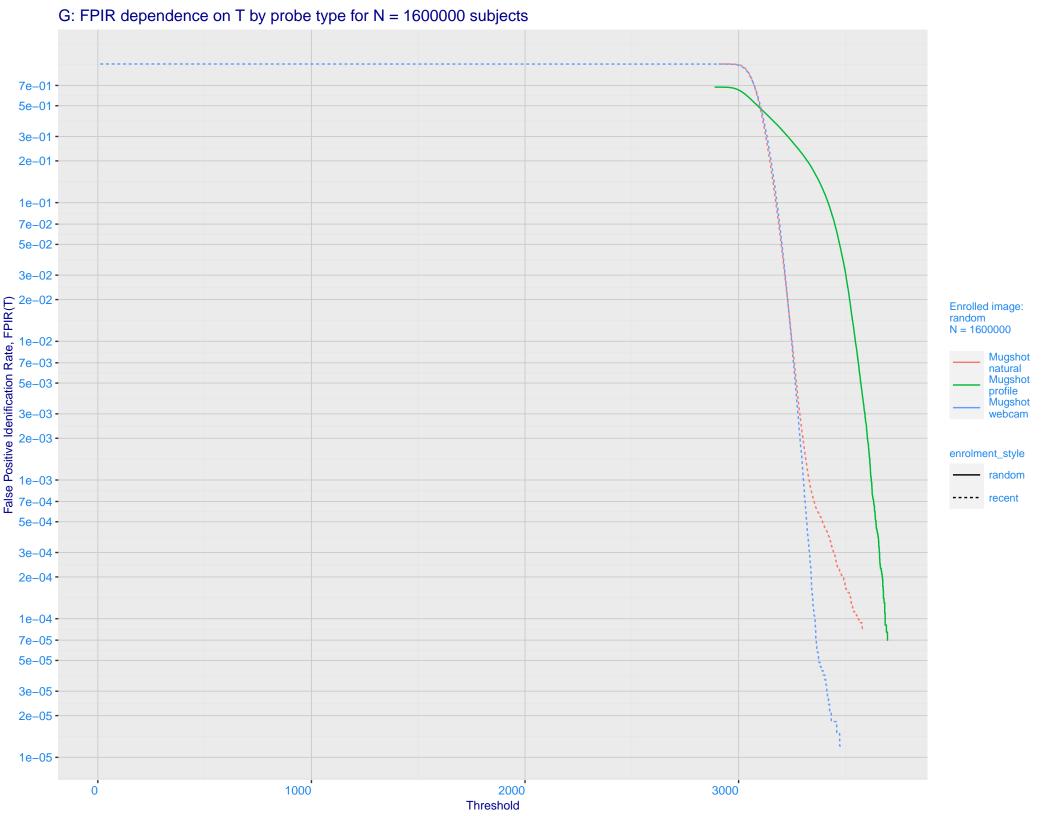
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration** Mugshot **Immigration** visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.002 - 0.001 - 0.500 -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

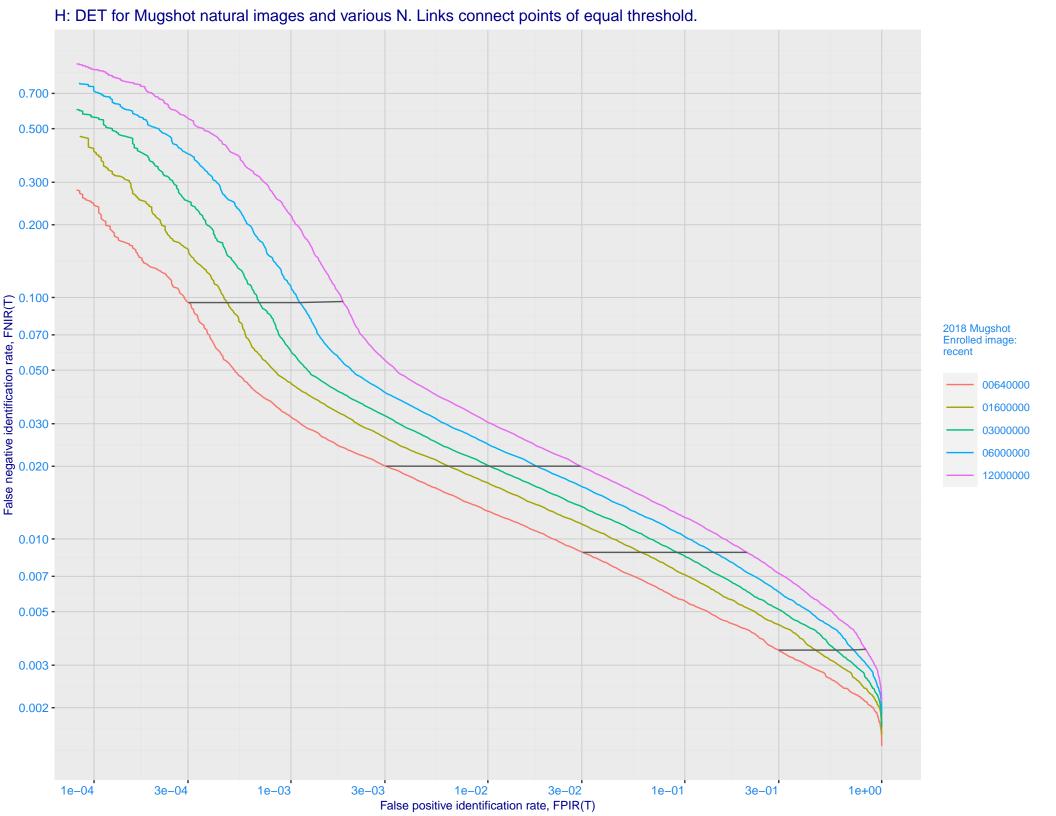
False positive identification rate, FPIR(T)

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

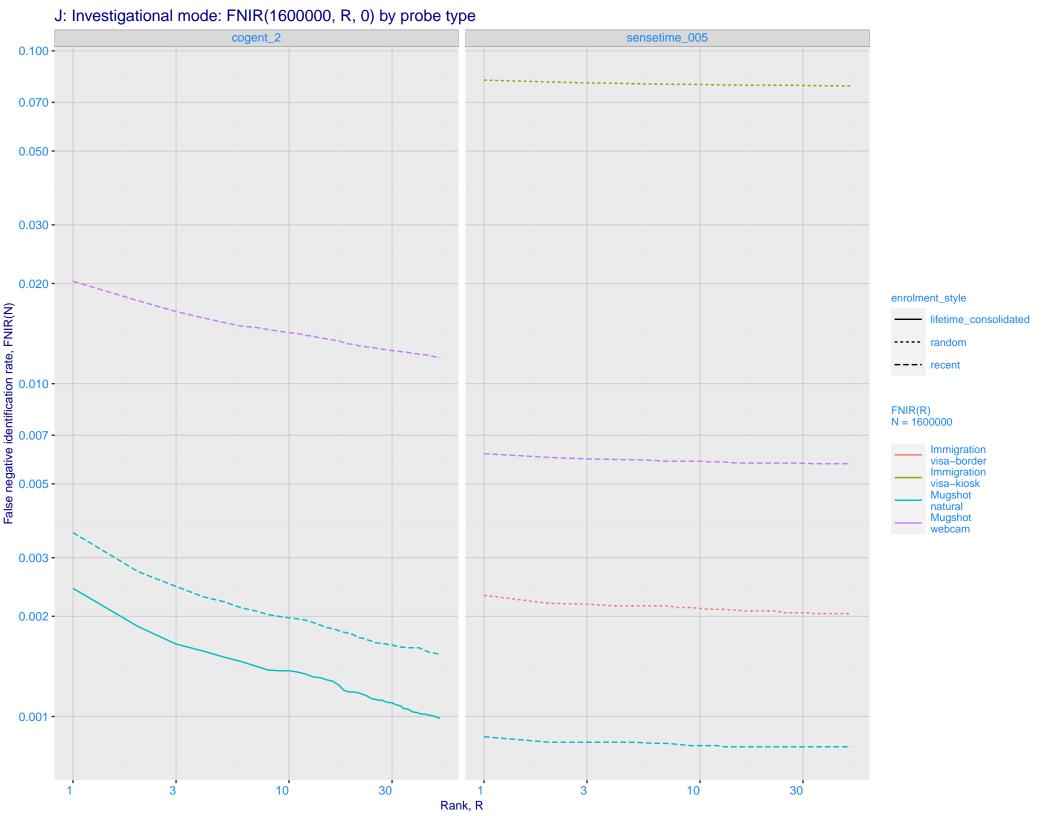


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

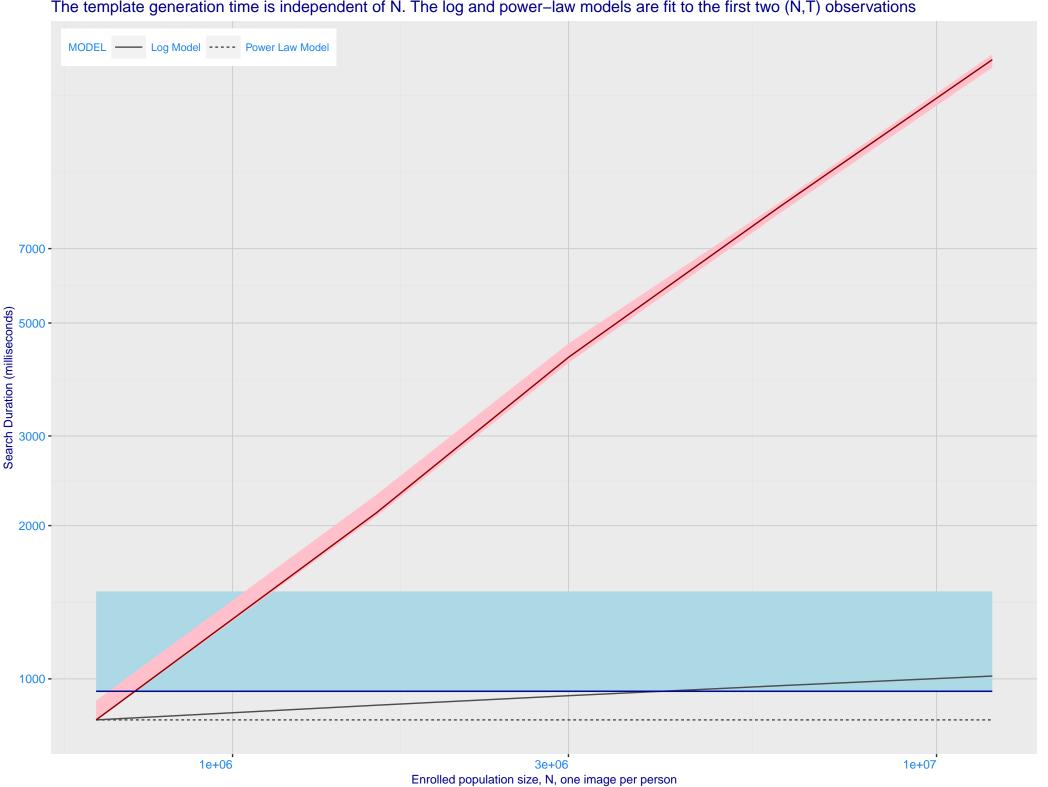


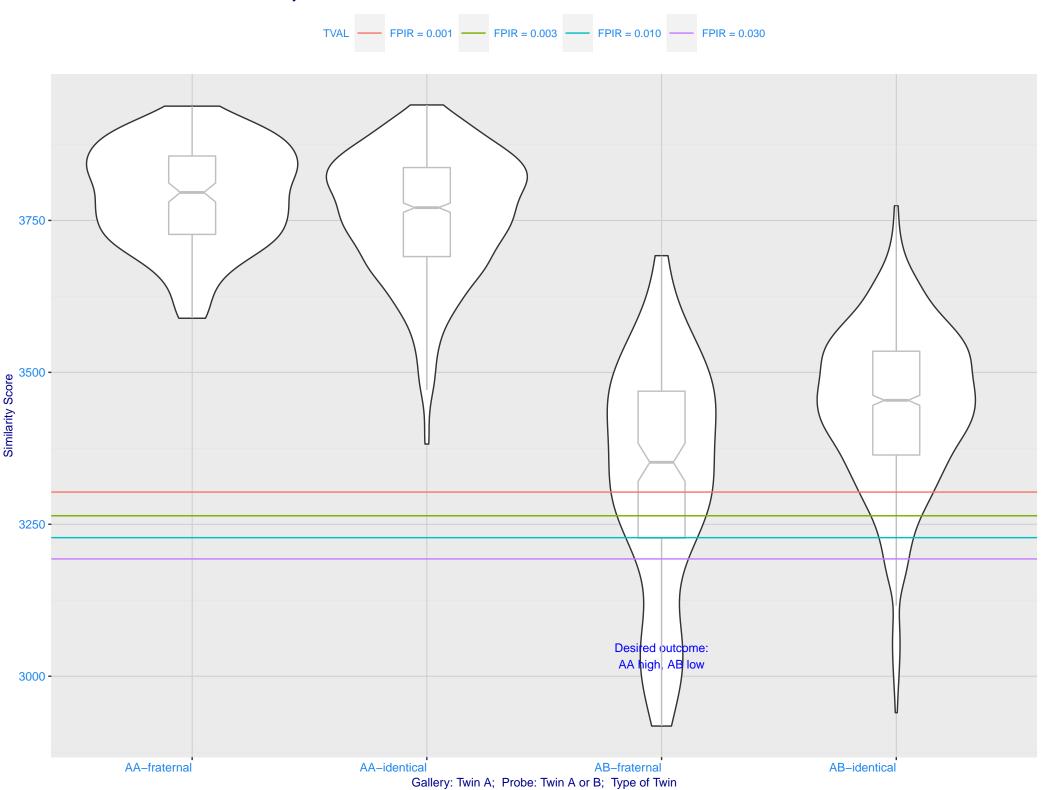


I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Palse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.050 - 0.030 - 0. enrolment\_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 - cogent\_2 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

