## A: Datasheet

Algorithm: cogent\_3

Developer: Thales

Submission Date: 2018\_10\_30

Template size: 1043 bytes

Template time (2.5 percentile): 939 msec

Template time (median): 941 msec

Template time (97.5 percentile): 1025 msec

Investigation:

Frontal mugshot ranking 75 (out of 279) -- FNIR(1600000, 0, 1) = 0.0038 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 92 (out of 241) -- FNIR(1600000, 0, 1) = 0.0214 vs. lowest 0.0062 from sensetime\_005

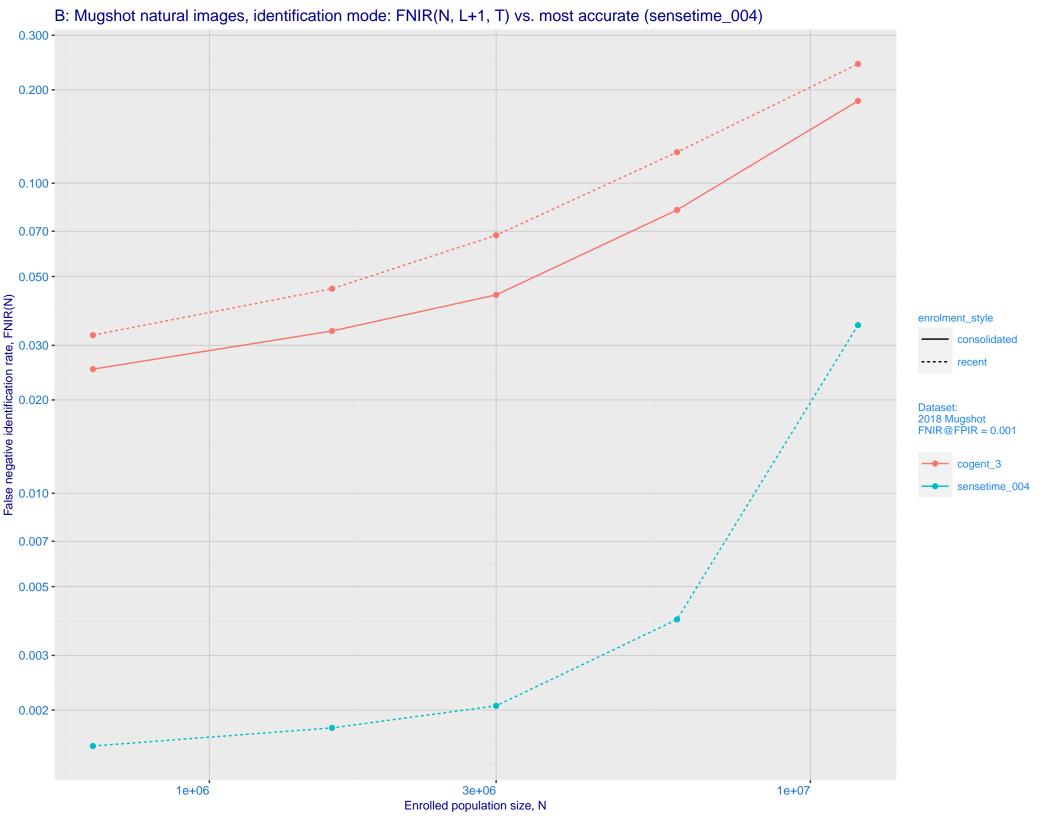
Mugshot profile ranking 150 (out of 210) -- FNIR(1600000, 0, 1) = 0.9391 vs. lowest 0.0587 from xforwardai\_002

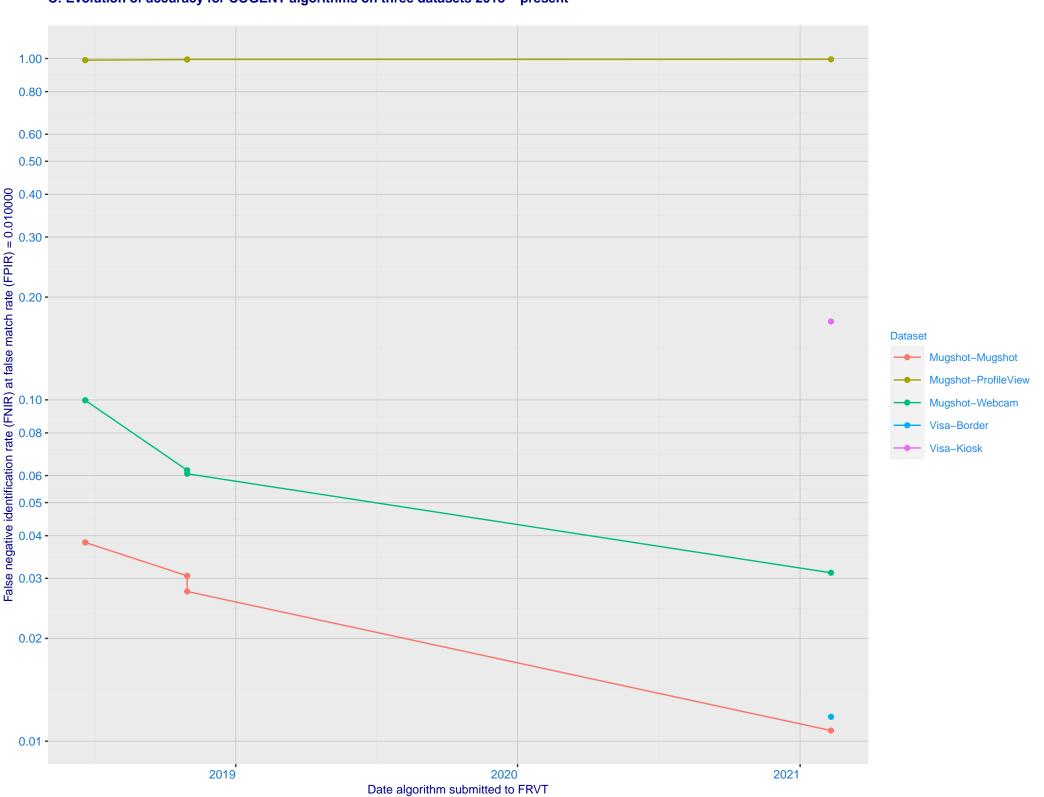
Identification:

Frontal mugshot ranking 84 (out of 279) -- FNIR(1600000, T, L+1) = 0.0457, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

Mugshot webcam ranking 69 (out of 236) -- FNIR(1600000, T, L+1) = 0.0951, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

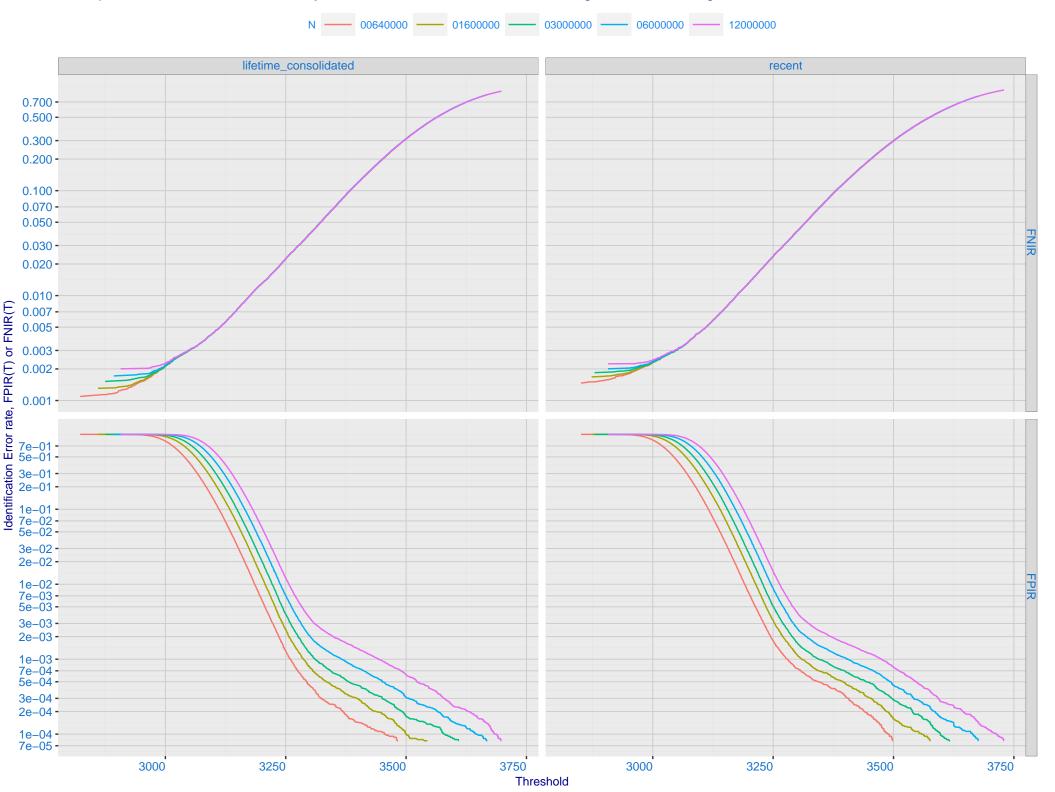
Mugshot profile ranking 126 (out of 209) -- FNIR(1600000, T, L+1) = 0.9978, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk\_hr\_000



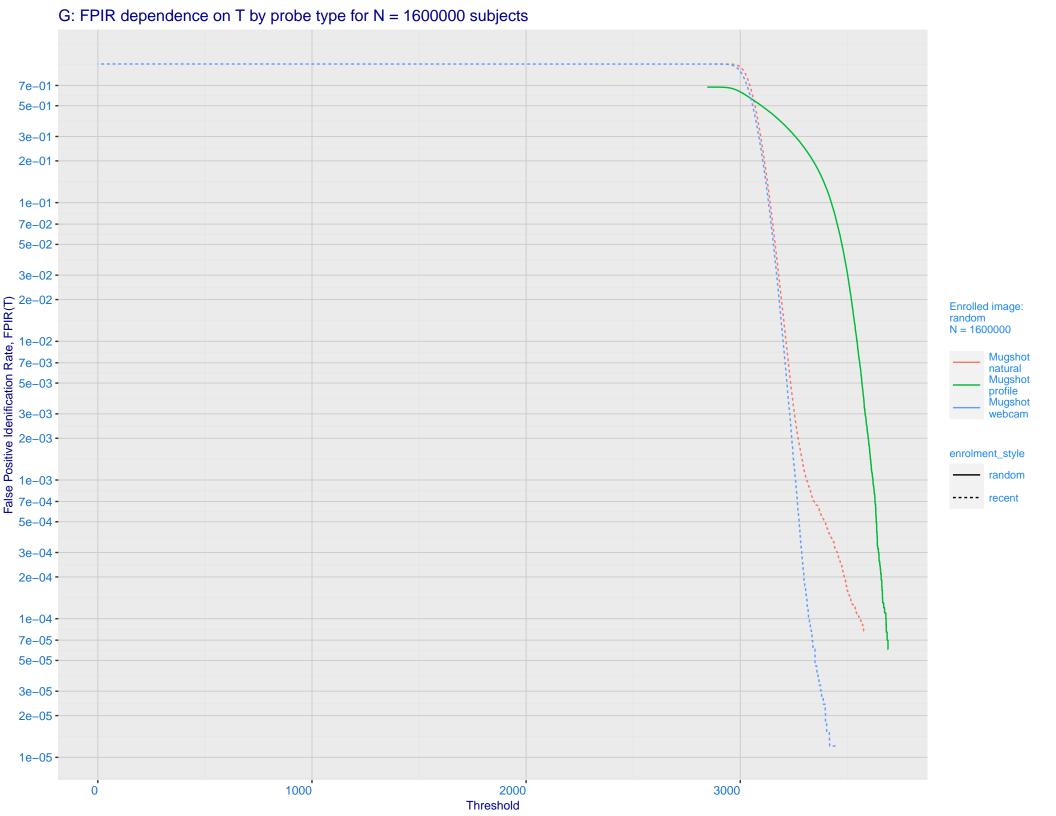


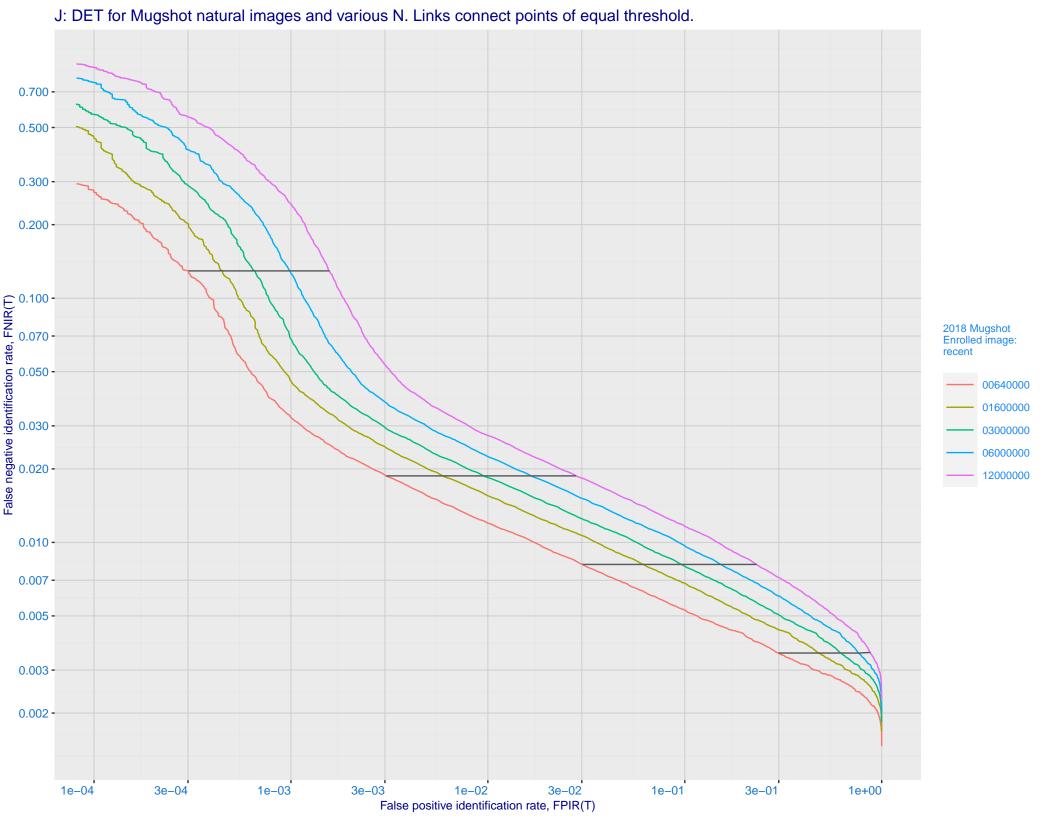
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals **Immigration Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.0001 - 0.700 - 0.500 - 0.200 - 0 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 -

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

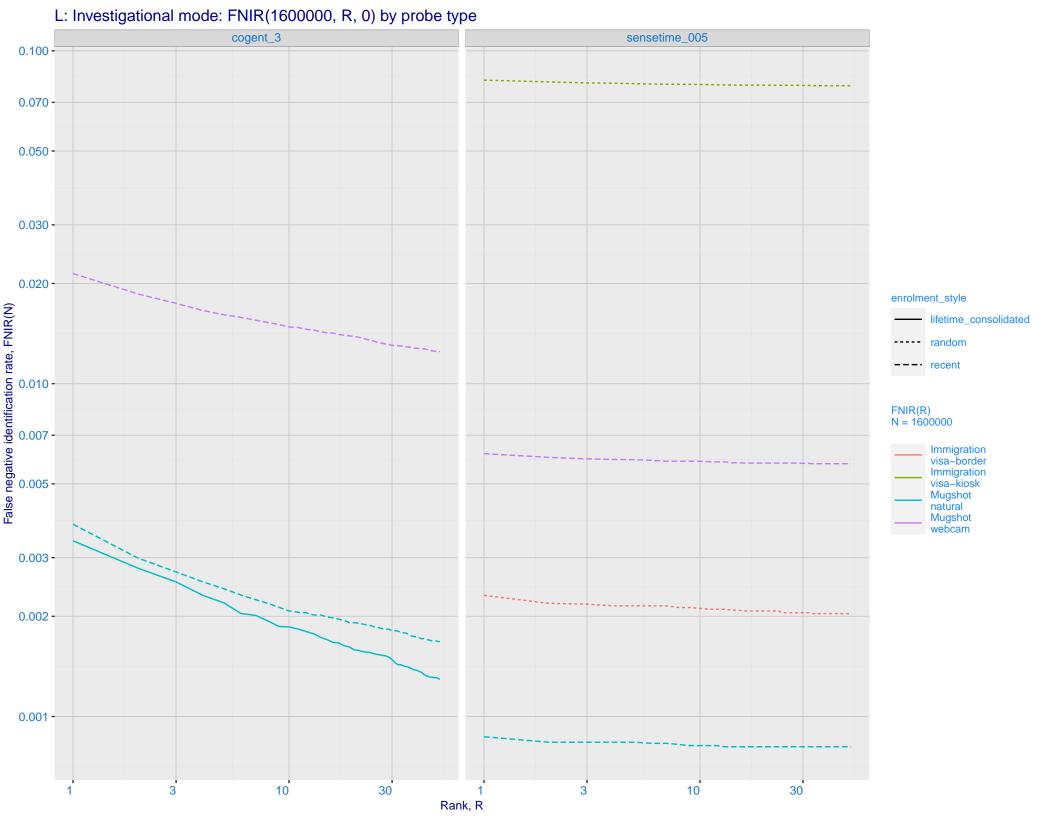


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

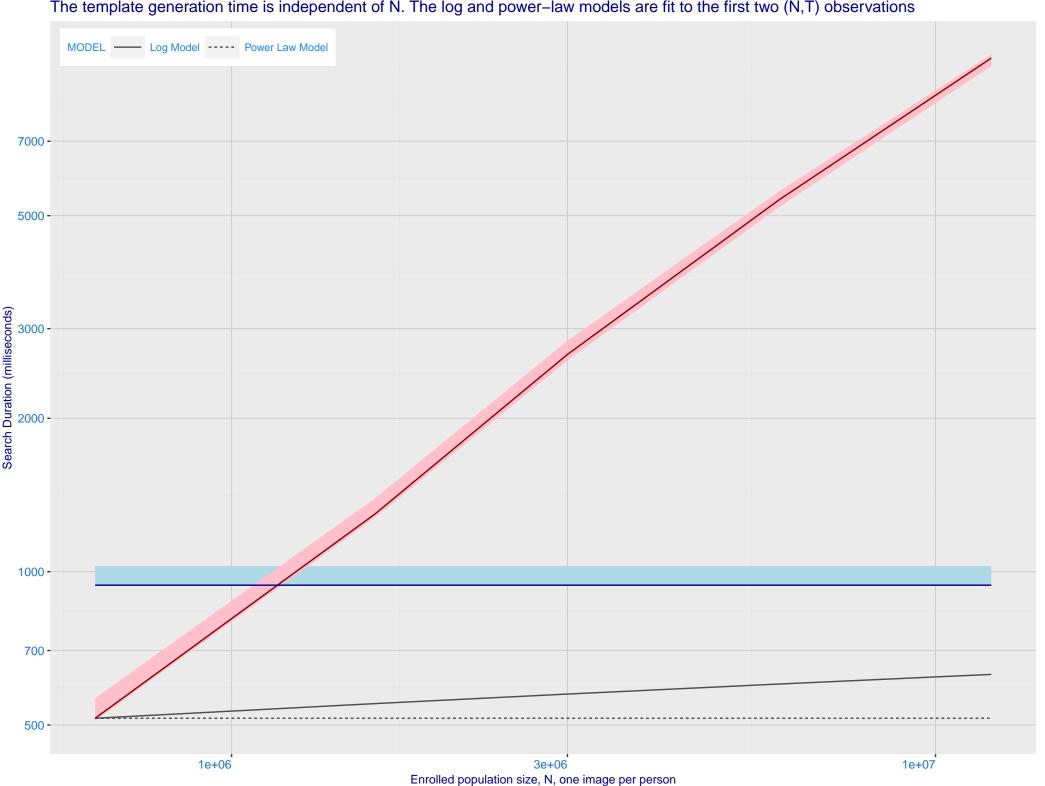




K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.050 - 0.030 - 0. enrolment\_style consolidated ---- random --- recent Mugshot Mugshot webcam natural FNIR@Rank = 1 - cogent\_3 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

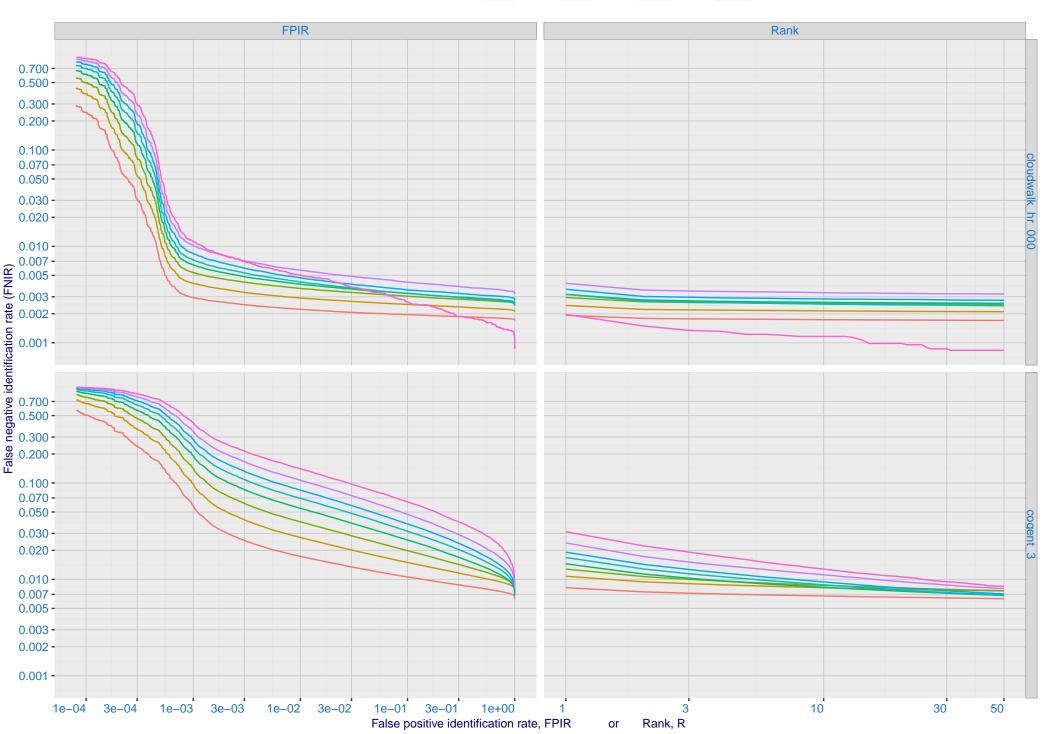


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations



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





R: Decline of genuine scores with ageing, with some eventually dropping below typical thresholds shown by the horizontal lines 4000 -3750 -Dataset: 2018 Mugshot N= 3.1M Color encodes FNIR (Rank = 1) 0.15 3500 -0.10 0.05 0.00 TVAL 3250 -- FPIR = 0.001 FPIR = 0.003 FPIR = 0.010FPIR = 0.030 3000 -(00,02](02,04](04,06](06,08](08,10](10,12](12,14](14,18]

Time lapse between search and initial encounter enrollment (years)