## A: Datasheet

Algorithm: ntechlab\_4

Developer: N-Tech Lab

Submission Date: 2018\_06\_21

Template size: 3482 bytes

Template time (2.5 percentile): 901 msec

Template time (median): 923 msec

Template time (97.5 percentile): 980 msec

Investigation:

Frontal mugshot ranking 94 (out of 279) -- FNIR(1600000, 0, 1) = 0.0048 vs. lowest 0.0009 from sensetime\_005

Mugshot webcam ranking 79 (out of 241) -- FNIR(1600000, 0, 1) = 0.0190 vs. lowest 0.0062 from sensetime\_005

Mugshot profile ranking 56 (out of 210) -- FNIR(1600000, 0, 1) = 0.5056 vs. lowest 0.0587 from xforwardai\_002

Immigration visa-border ranking 63 (out of 168) — FNIR(1600000, 0, 1) = 0.0077 vs. lowest 0.0013 from visionlabs\_010

Immigration visa-kiosk ranking 57 (out of 165) -- FNIR(1600000, 0, 1) = 0.1294 vs. lowest 0.0568 from cloudwalk\_hr\_000

Identification:

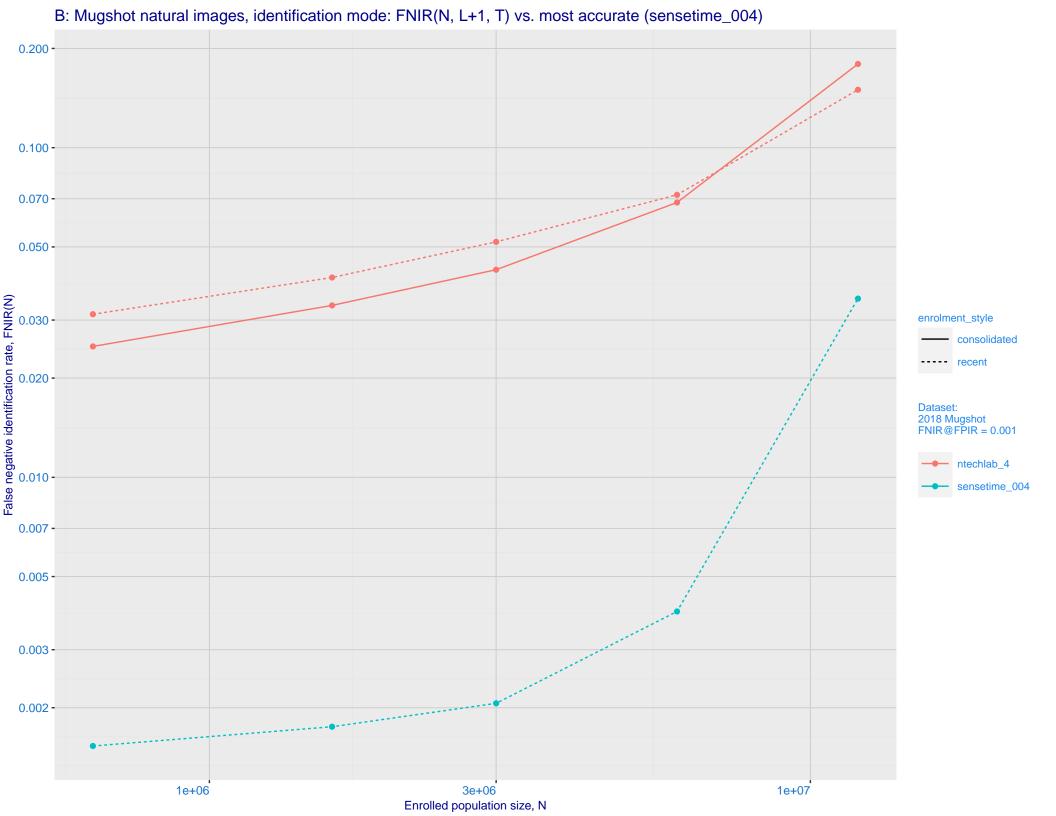
Frontal mugshot ranking 72 (out of 279) -- FNIR(1600000, T, L+1) = 0.0404, FPIR=0.001000 vs. lowest 0.0018 from sensetime\_004

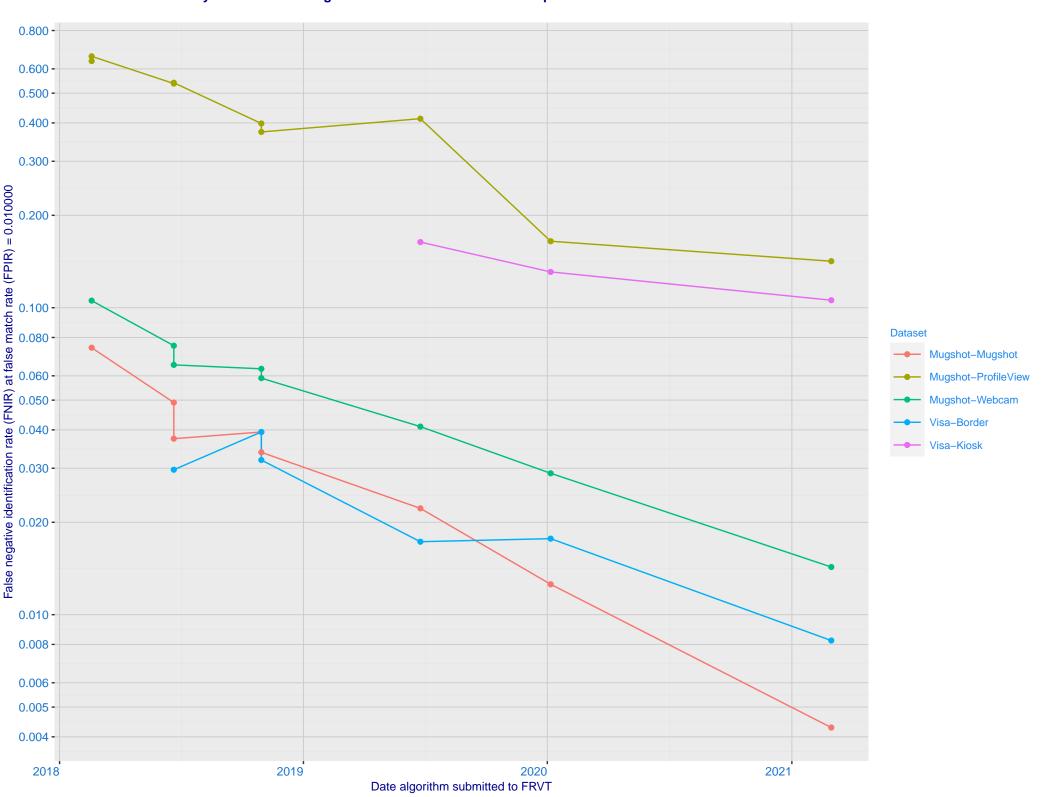
Mugshot webcam ranking 78 (out of 236) -- FNIR(1600000, T, L+1) = 0.1045, FPIR=0.001000 vs. lowest 0.0122 from sensetime\_003

Mugshot profile ranking 27 (out of 209) -- FNIR(1600000, T, L+1) = 0.8336, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk\_hr\_000

Immigration visa-border ranking 55 (out of 167) -- FNIR(1600000, T, L+1) = 0.0527, FPIR=0.001000 vs. lowest 0.0047 from idemia\_008

Immigration visa-kiosk ranking 36 (out of 162) — FNIR(1600000, T, L+1) = 0.2648, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk\_hr\_000

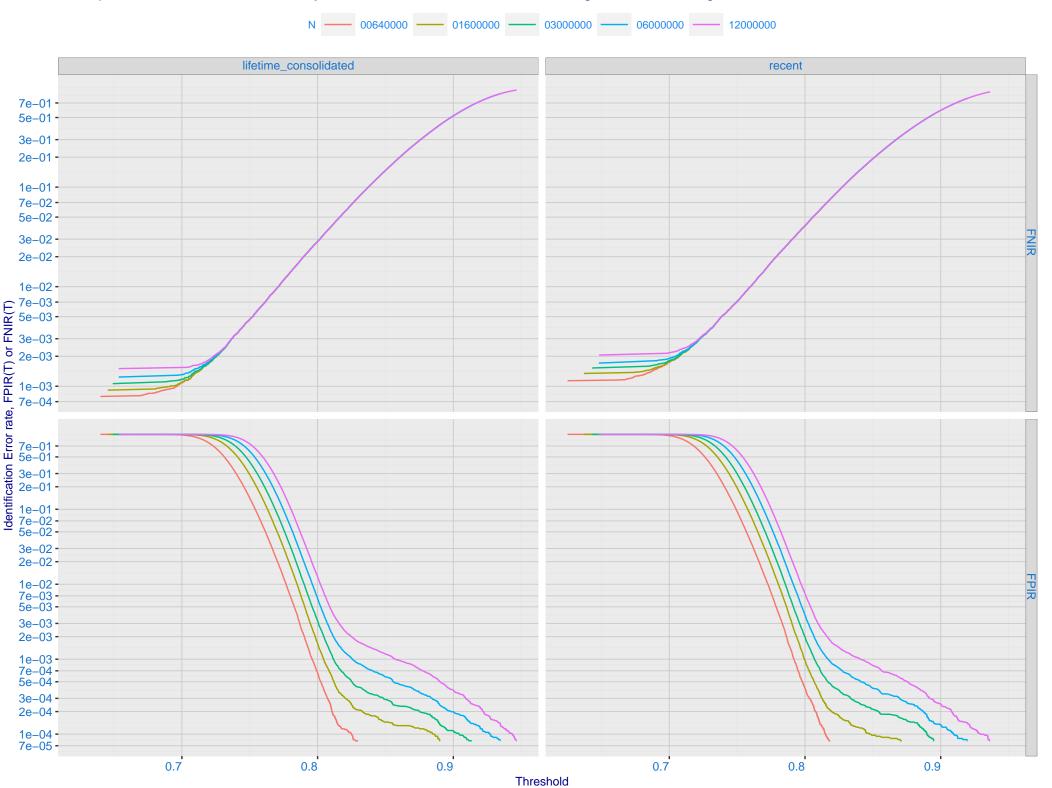




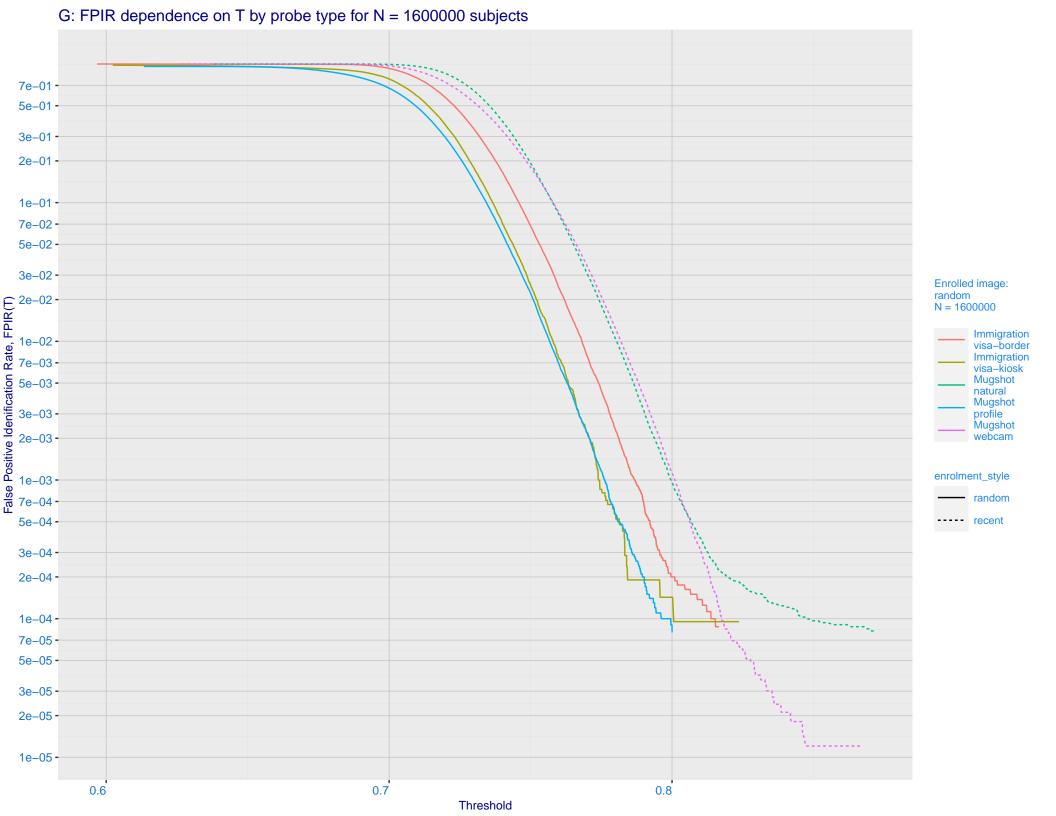
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration Immigration Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.000 - 0.500 - 0.500 - 0.200 - 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 -

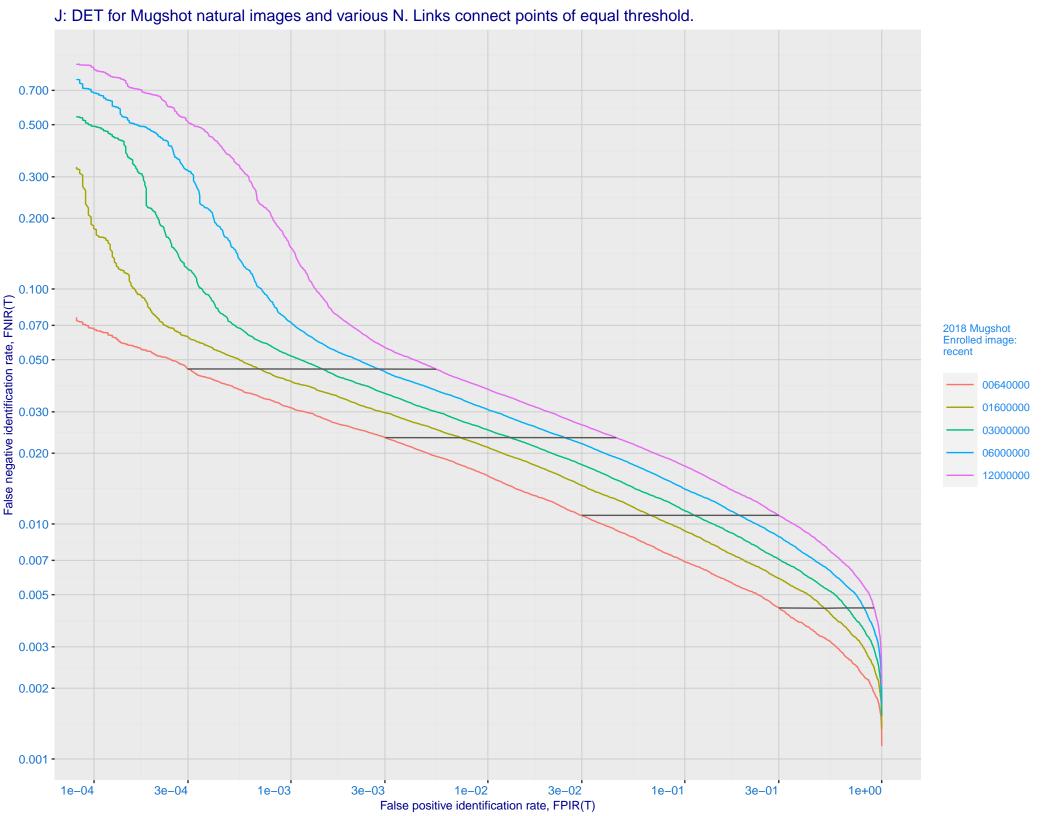
False positive identification rate, FPIR(T)

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

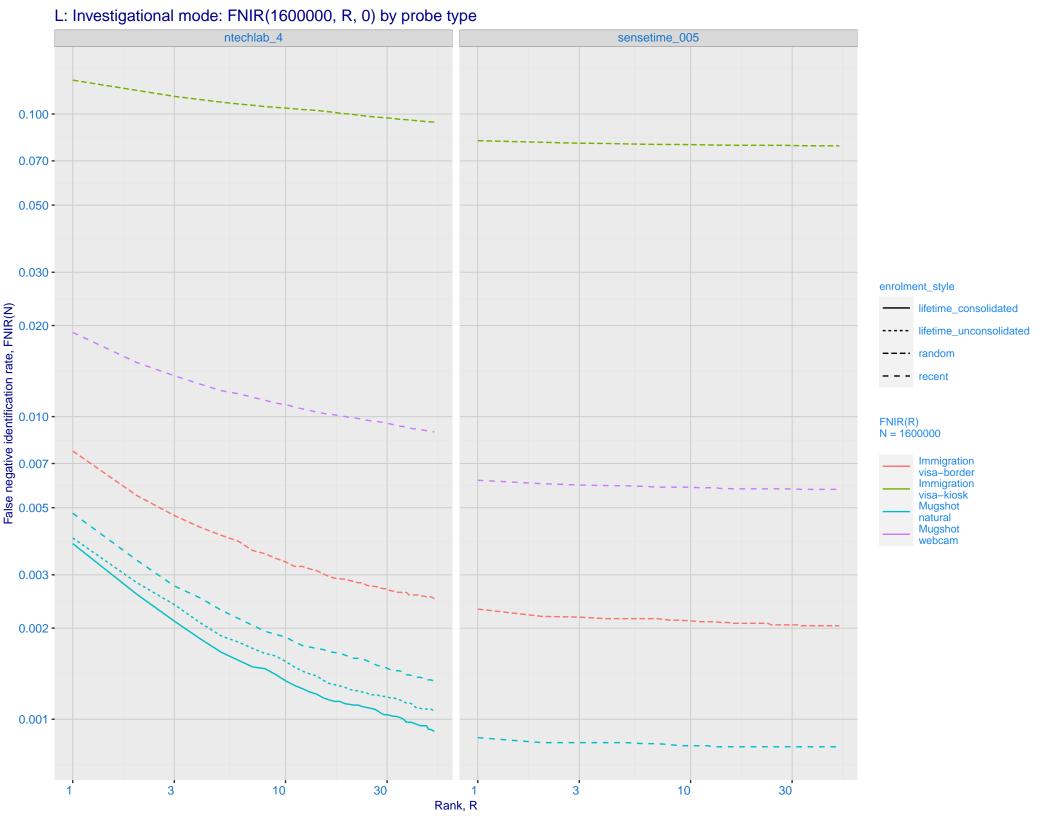


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

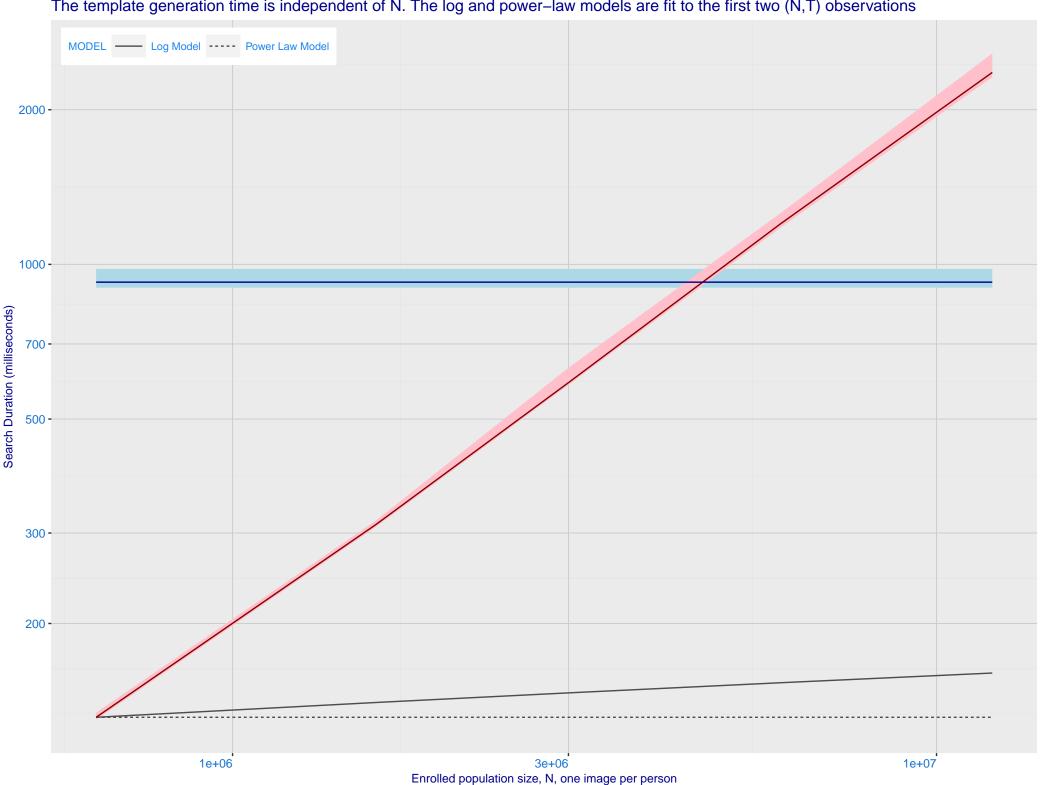




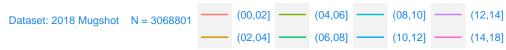
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_005) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 - 0.002 - 0.001 - 0.001 - 0.000 - 0.000 - 0.050 enrolment\_style consolidated ---- random --- recent - - - unconsolidated Mugshot Mugshot webcam natural FNIR@Rank = 1 ntechlab\_4 sensetime\_005 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

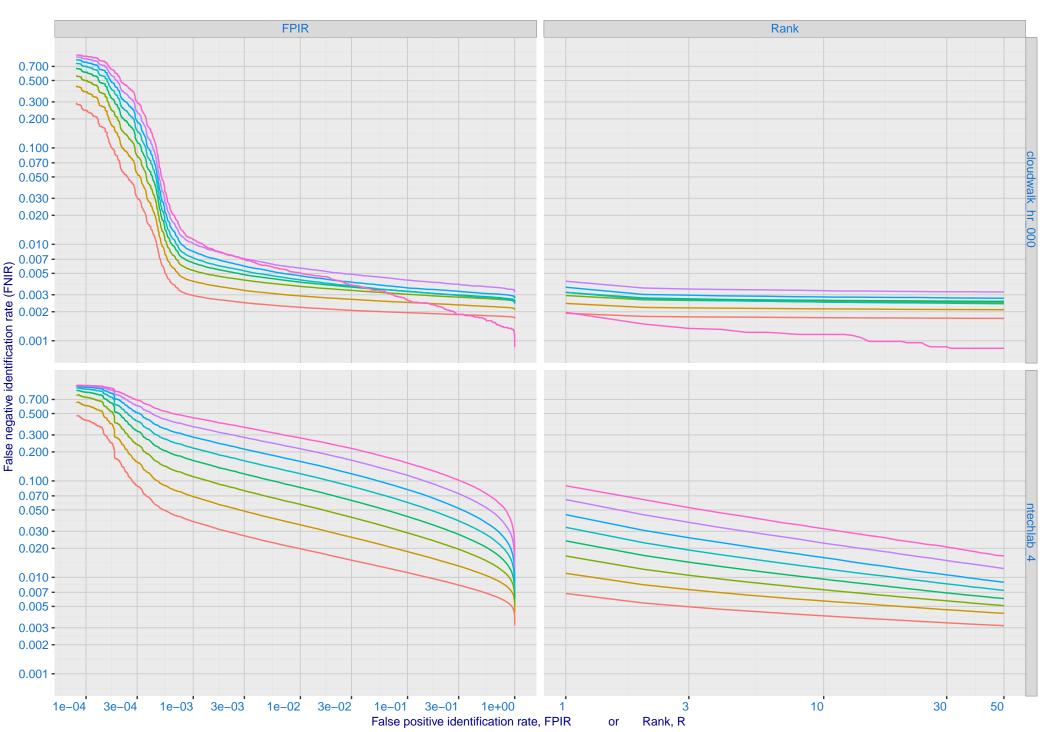


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations



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 1.0 -Dataset: 2018 Mugshot N= 3.1M Color encodes FNIR (Rank = 1) 0.9 -0.15 0.10 0.05 0.00 TVAL - FPIR = 0.001 - FPIR = 0.003 FPIR = 0.010FPIR = 0.030 0.7 -(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)