## A: Datasheet

Algorithm: ntechlab\_008

Developer: N-Tech Lab

Submission Date: 2020\_01\_06

Template size: 1300 bytes

Template time (2.5 percentile): 552 msec

Template time (median): 554 msec

Template time (97.5 percentile): 603 msec

Investigation:

Frontal mugshot ranking 47 (out of 329) -- FNIR(1600000, 0, 1) = 0.0017 vs. lowest 0.0009 from sensetime\_006

Mugshot webcam ranking 28 (out of 291) -- FNIR(1600000, 0, 1) = 0.0096 vs. lowest 0.0057 from sensetime\_006

Mugshot profile ranking 39 (out of 260) -- FNIR(1600000, 0, 1) = 0.1570 vs. lowest 0.0550 from sensetime\_006

Immigration visa-border ranking 48 (out of 218) -- FNIR(1600000, 0, 1) = 0.0034 vs. lowest 0.0009 from sensetime\_006

Immigration visa-kiosk ranking 41 (out of 215) -- FNIR(1600000, 0, 1) = 0.0837 vs. lowest 0.0487 from cubox\_000

Identification:

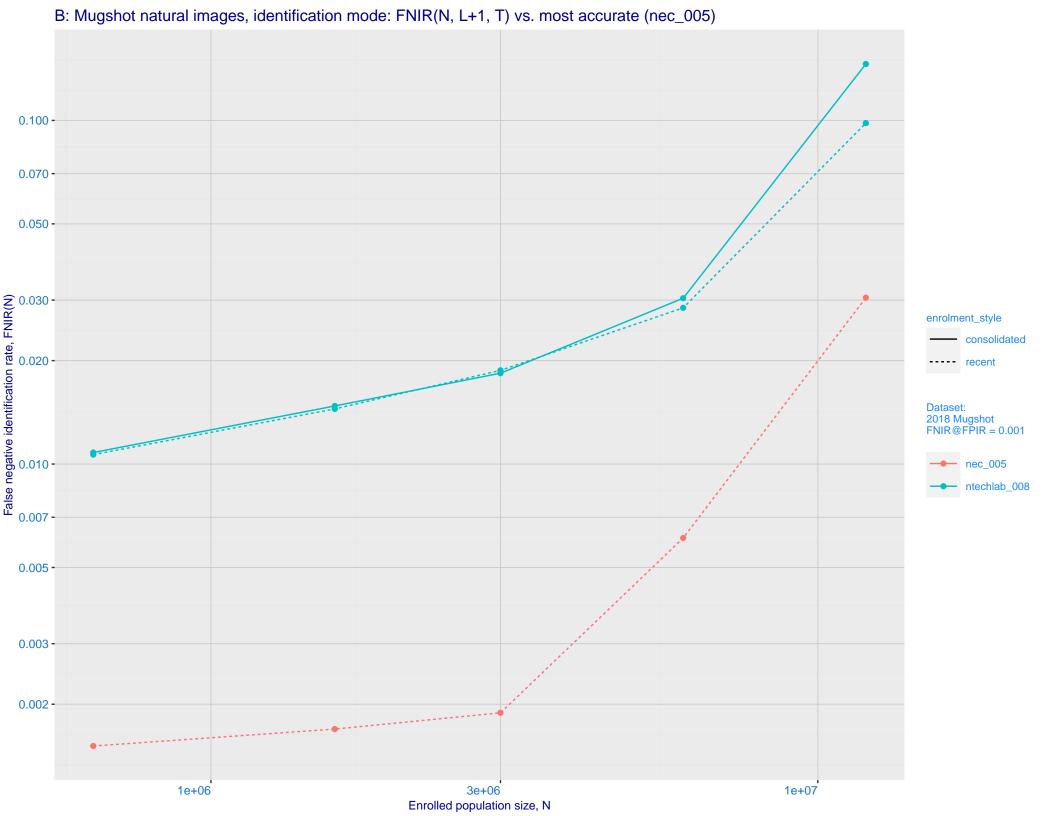
Frontal mugshot ranking 53 (out of 329) -- FNIR(1600000, T, L+1) = 0.0145, FPIR=0.001000 vs. lowest 0.0017 from nec\_005

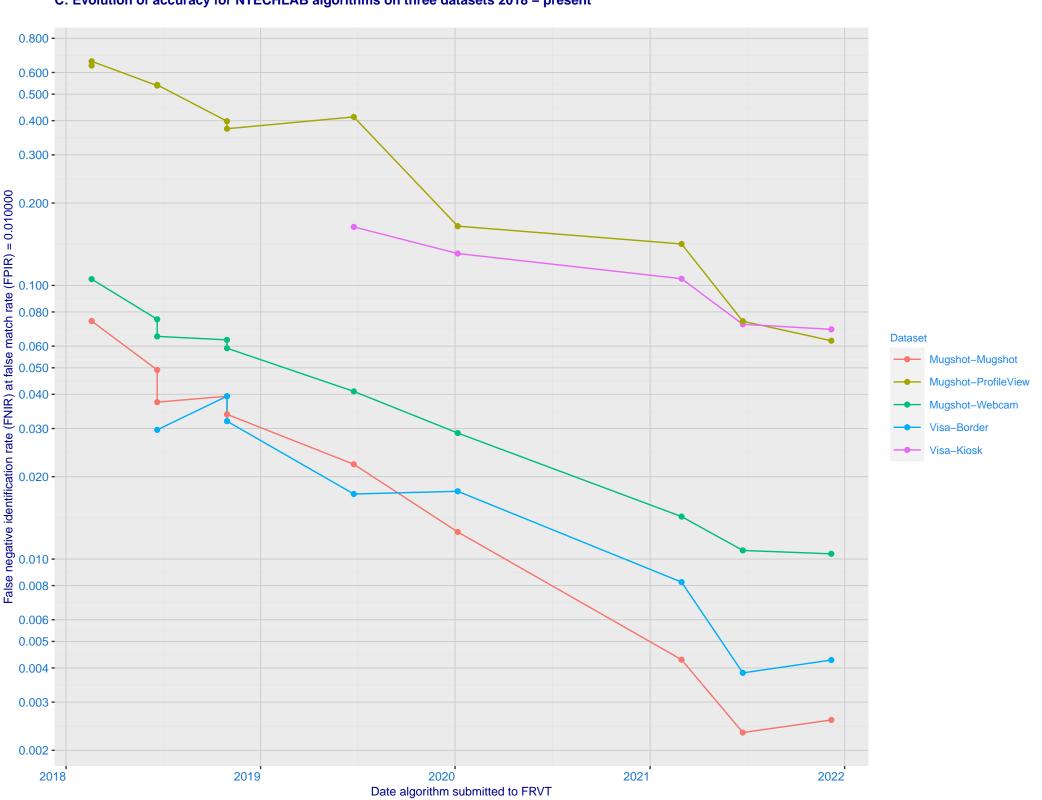
Mugshot webcam ranking 46 (out of 289) -- FNIR(1600000, T, L+1) = 0.0454, FPIR=0.001000 vs. lowest 0.0120 from nec\_005

Mugshot profile ranking 23 (out of 259) -- FNIR(1600000, T, L+1) = 0.5290, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk\_hr\_000

Immigration visa-border ranking 74 (out of 217) -- FNIR(1600000, T, L+1) = 0.0333, FPIR=0.001000 vs. lowest 0.0032 from paravision\_009

Immigration visa-kiosk ranking 42 (out of 212) -- FNIR(1600000, T, L+1) = 0.1833, FPIR=0.001000 vs. lowest 0.0728 from paravision\_009

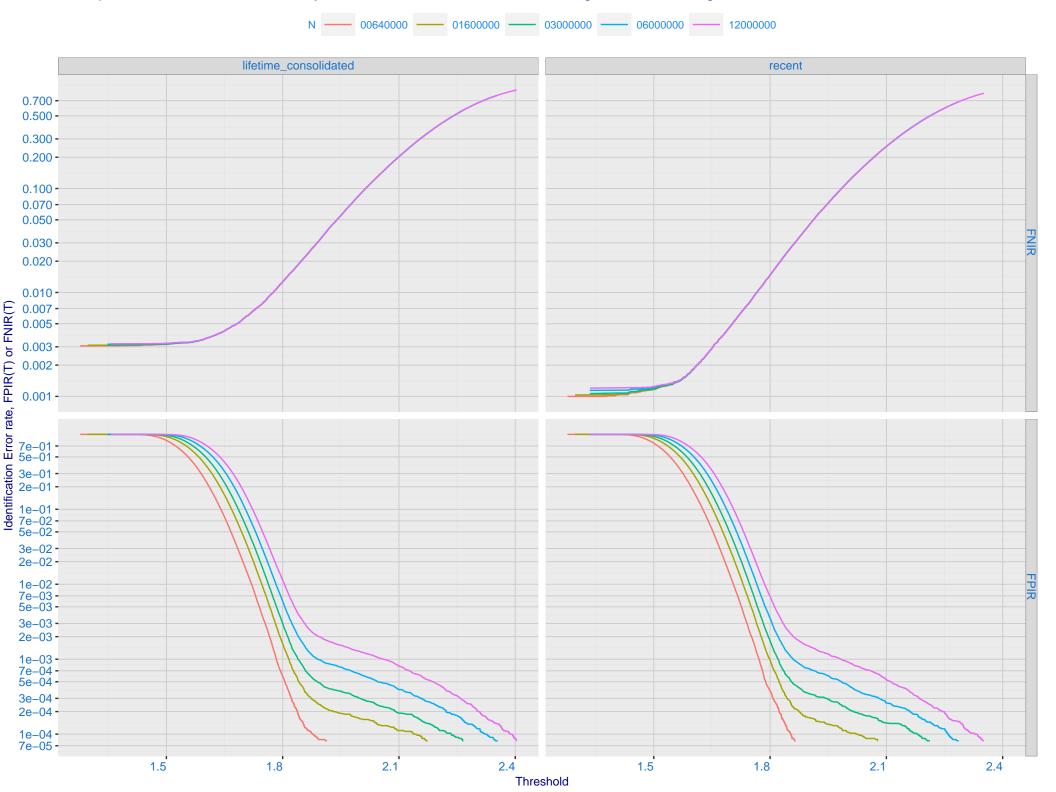




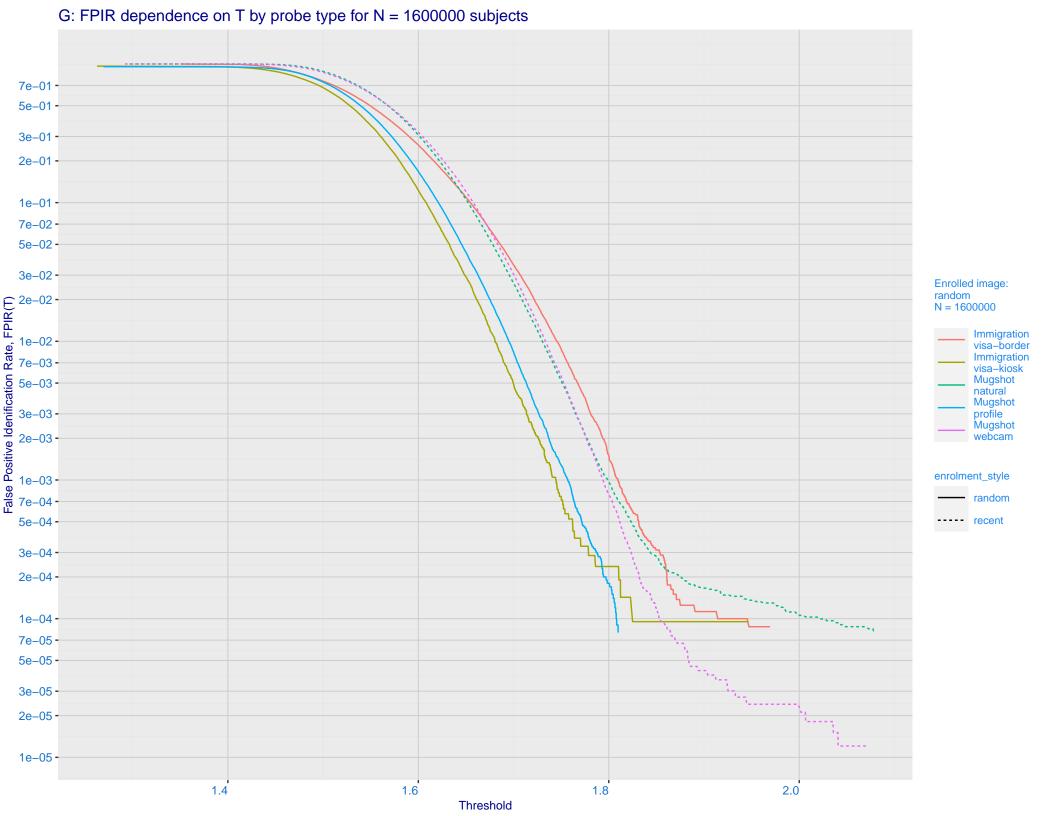
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Calse negative identification rate, FNIR(T) 0.003 - 0.002 - 0.001 - 0.500 - 0.200 - 0.100 - 0. enrolment\_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.070 -0.050 ntechlab 008 0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

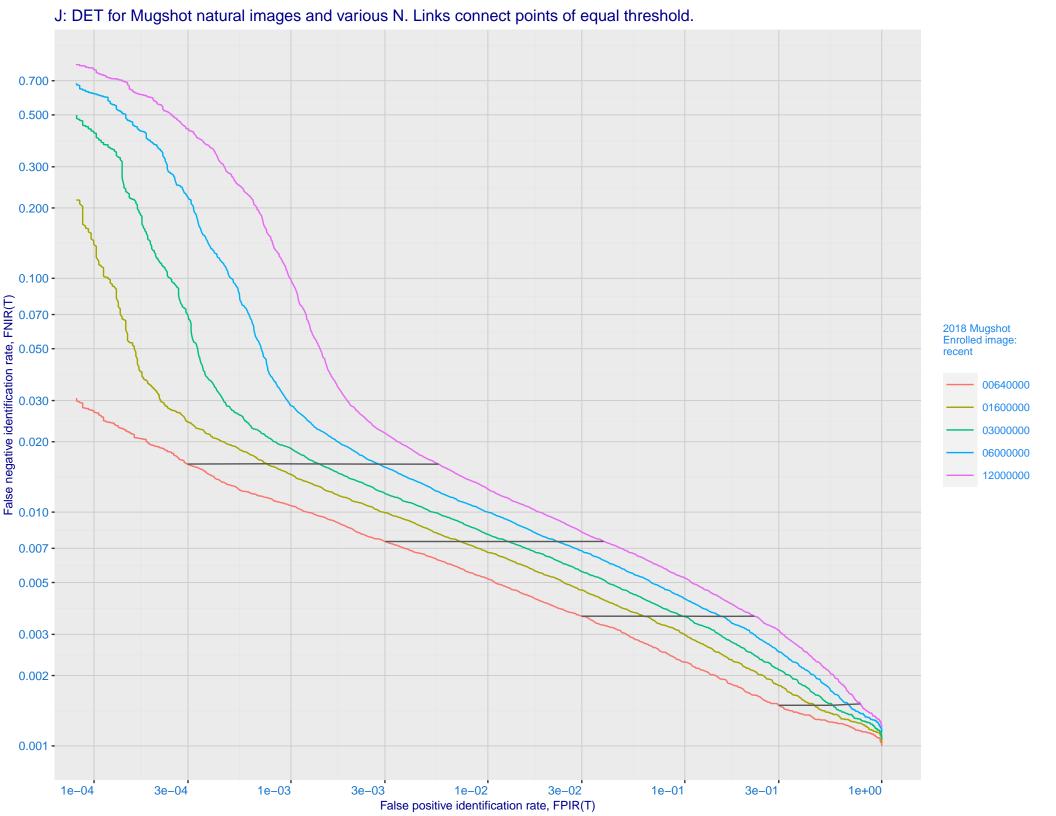
False positive identification rate, FPIR(T)

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

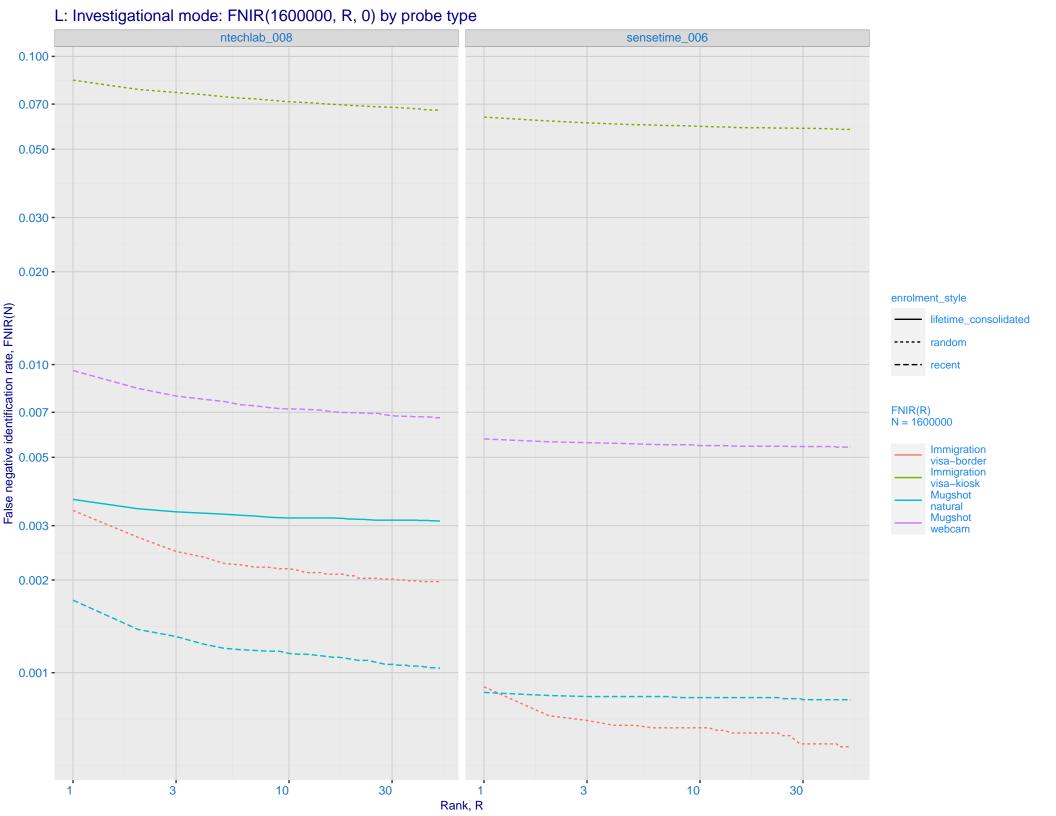


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

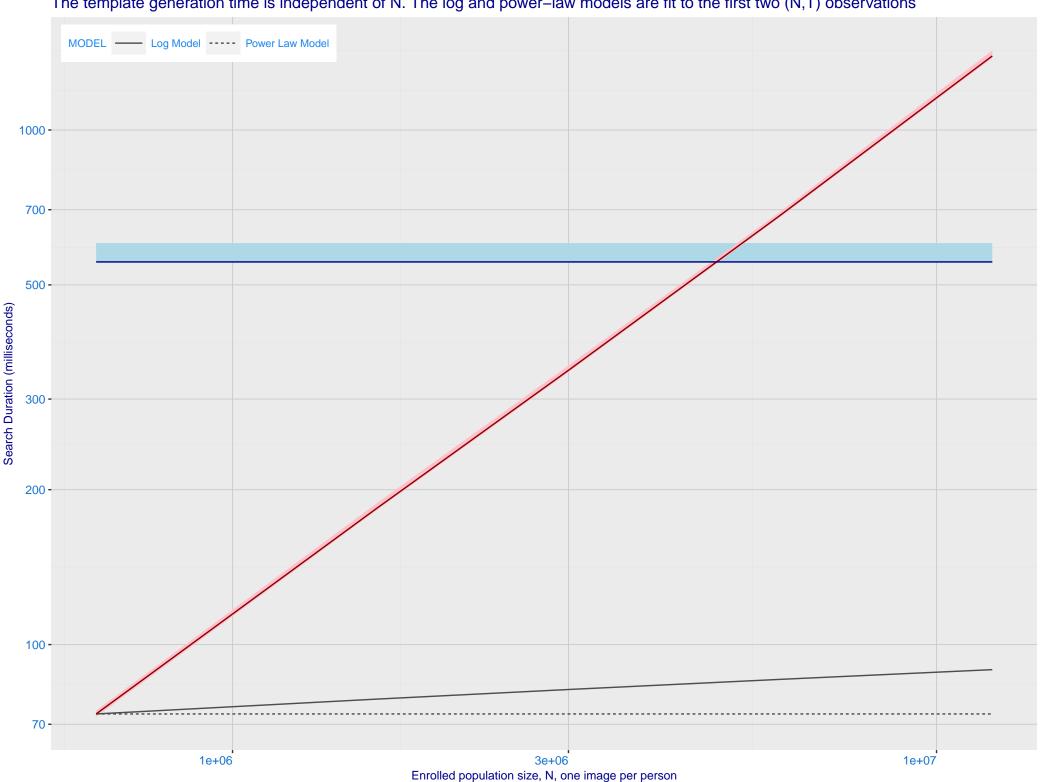




K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_006) Immigration Immigration visa-kiosk visa-border 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.050 - 0.030 - 0. enrolment\_style consolidated ---- random --- recent Mugshot Mugshot webcam natural FNIR@Rank = 1 ntechlab\_008 sensetime\_006 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

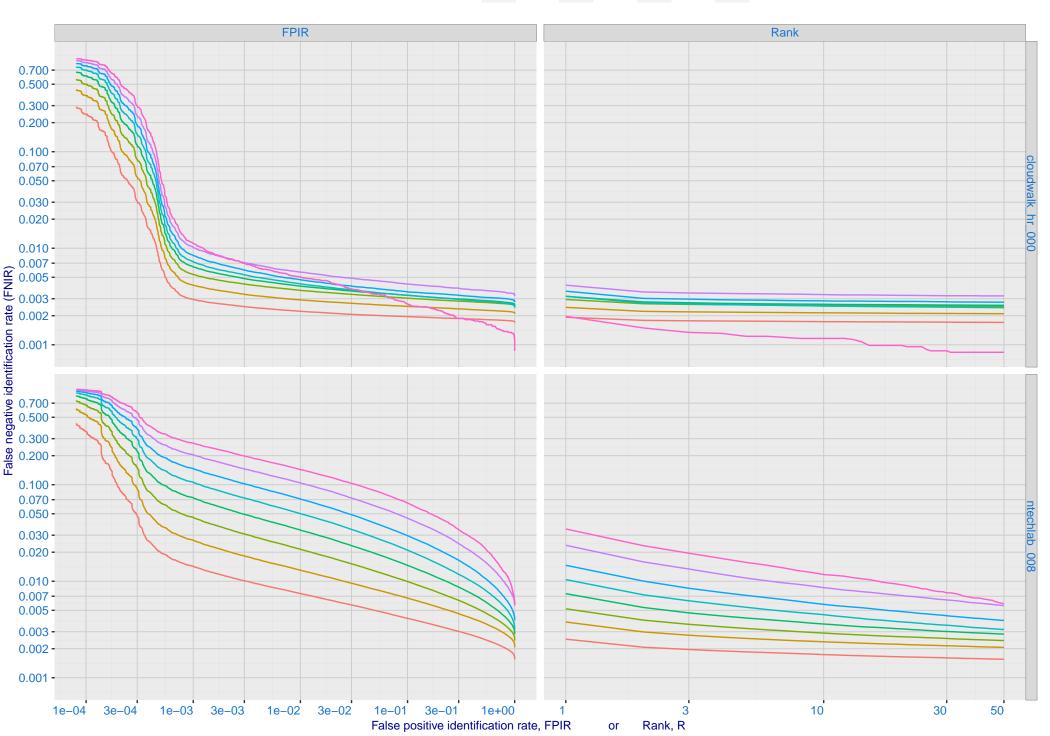


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations



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 Dataset: 2018 Mugshot N= 3.1M Color encodes FNIR (Rank = 1) 2.4 -0.15 0.10 0.05 0.00 **TVAL** - FPIR = 0.001 - FPIR = 0.003 FPIR = 0.010FPIR = 0.030 1.6 -(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)