A: Datasheet

Algorithm: nec_0

Developer: NEC

Submission Date: 2018_06_21

Template size: 2592 bytes

Template time (2.5 percentile): 79 msec

Template time (median): 82 msec

Template time (97.5 percentile): 89 msec

Investigation:

Frontal mugshot ranking 168 (out of 279) -- FNIR(1600000, 0, 1) = 0.0170 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 149 (out of 241) -- FNIR(1600000, 0, 1) = 0.0409 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 166 (out of 210) — FNIR(1600000, 0, 1) = 0.9586 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 92 (out of 168) — FNIR(1600000, 0, 1) = 0.0246 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 105 (out of 165) -- FNIR(1600000, 0, 1) = 0.2428 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

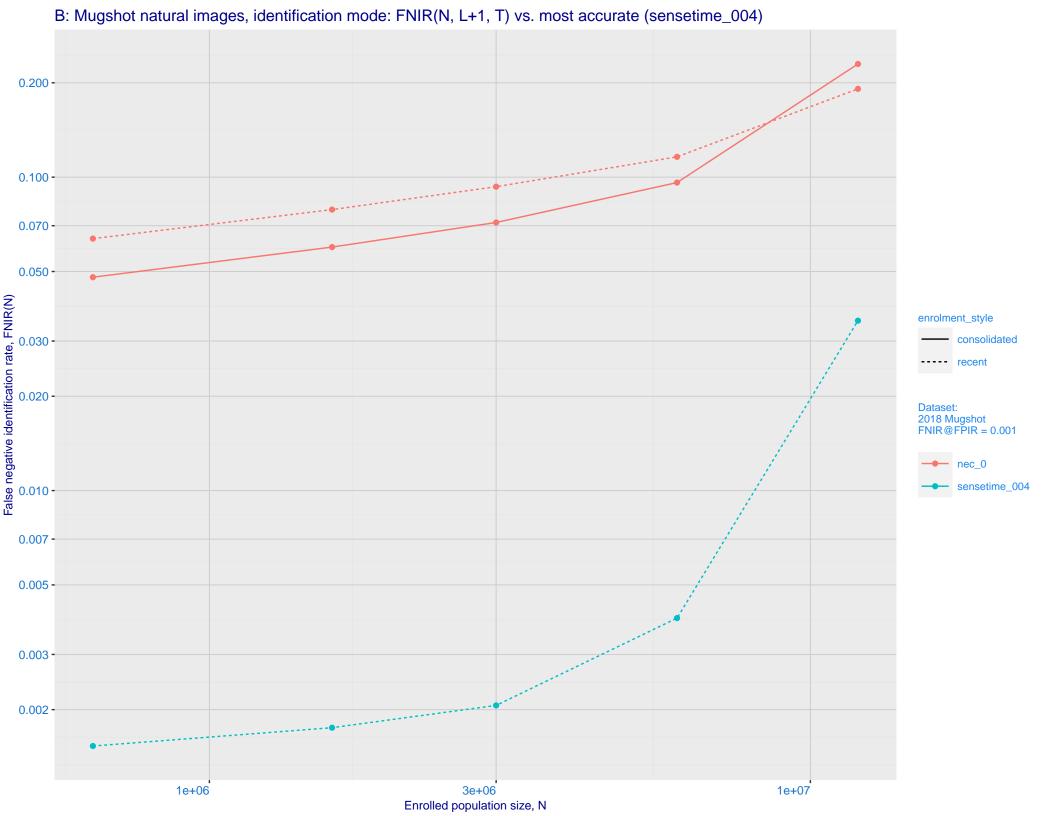
Frontal mugshot ranking 128 (out of 279) -- FNIR(1600000, T, L+1) = 0.0788, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

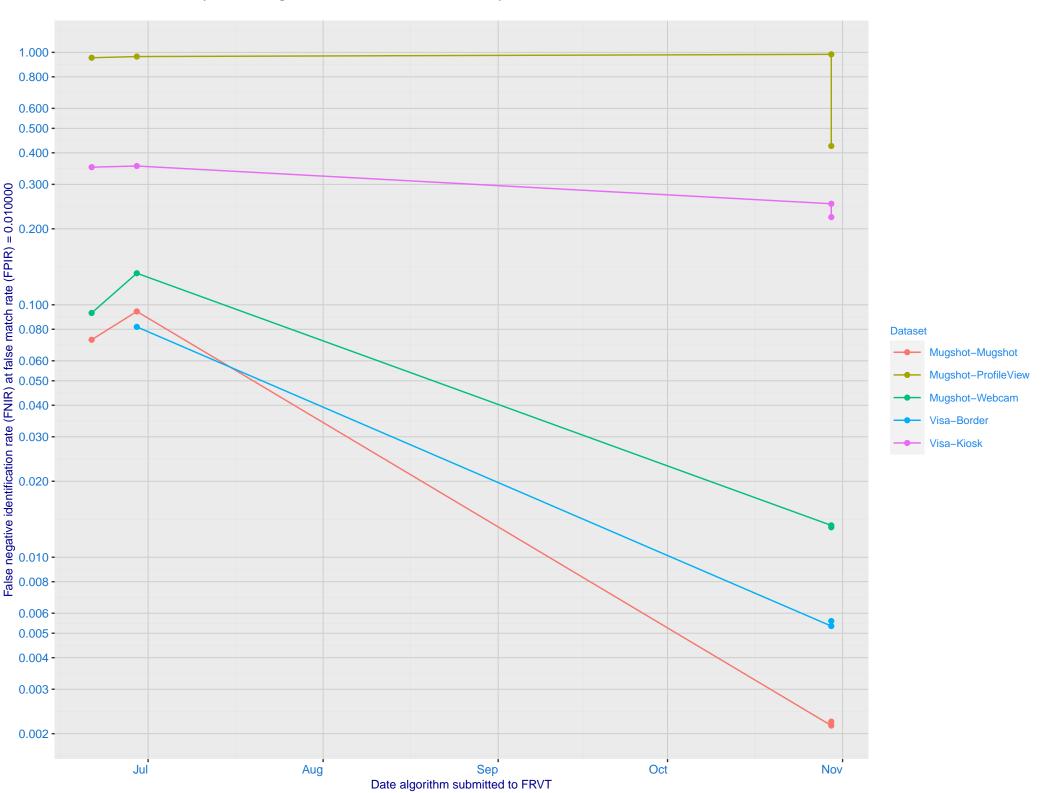
Mugshot webcam ranking 109 (out of 236) -- FNIR(1600000, T, L+1) = 0.1404, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 61 (out of 209) — FNIR(1600000, T, L+1) = 0.9793, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 167 (out of 167) -- FNIR(1600000, T, L+1) = NA, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 71 (out of 162) — FNIR(1600000, T, L+1) = 0.4745, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000



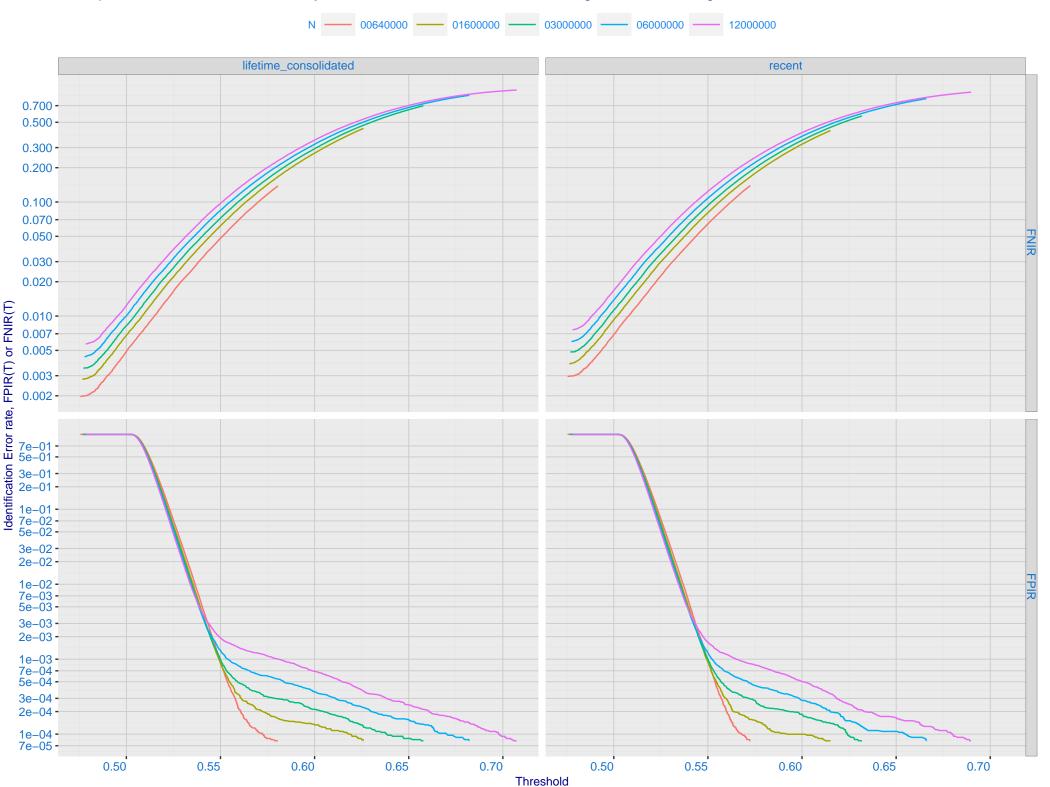


D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration Immigration Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.002 - 0.001 - 0.500 - 0.500 -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

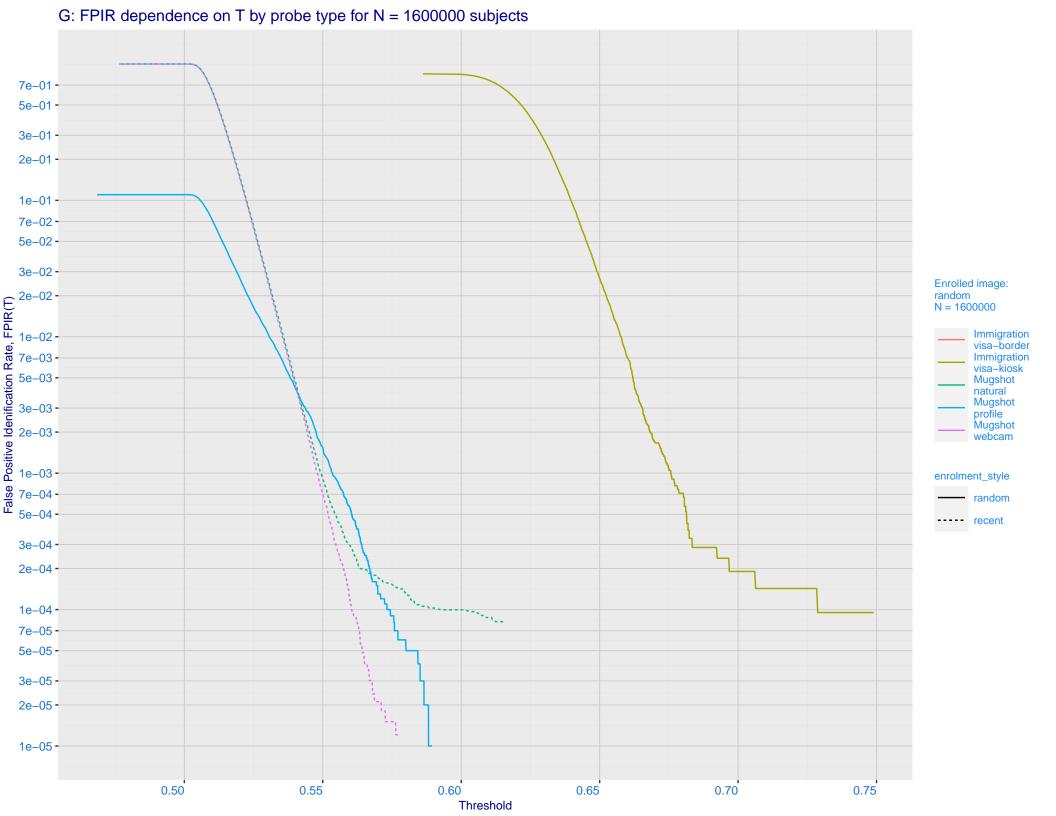
-03e-021e-03e-011e+001e-03e-04e-03e-03e-03e-021e-03e-011e+00

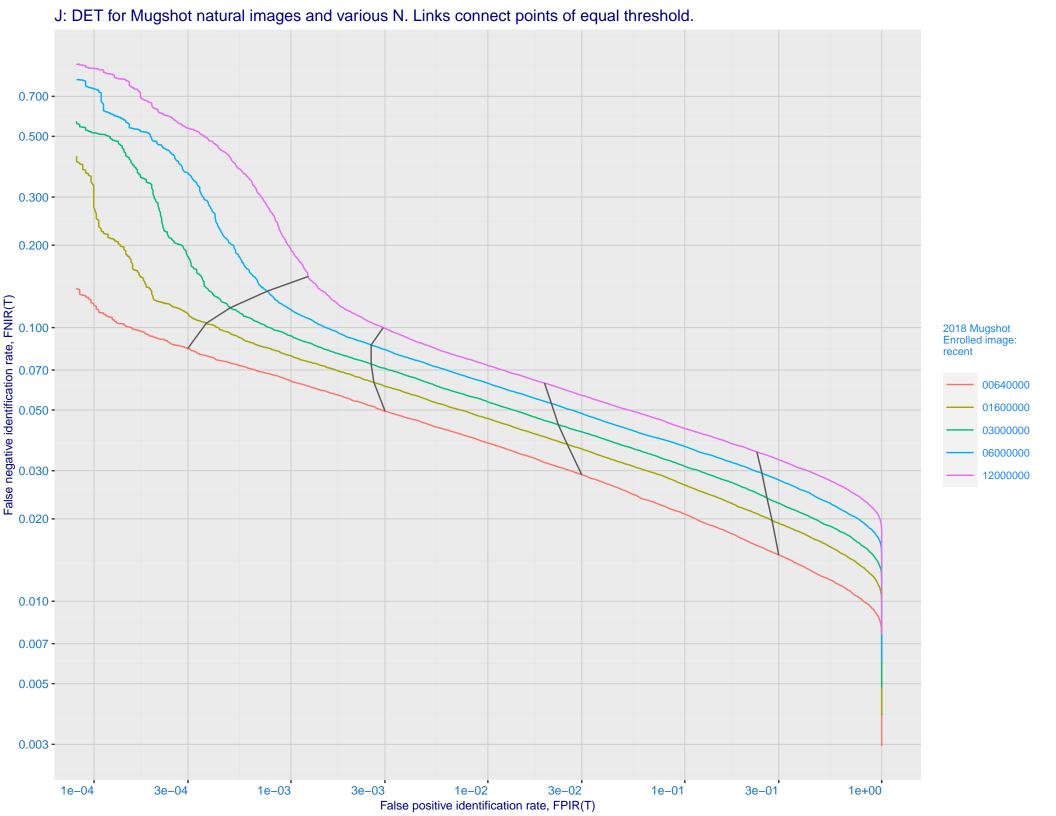
False positive identification rate, FPIR(T)

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

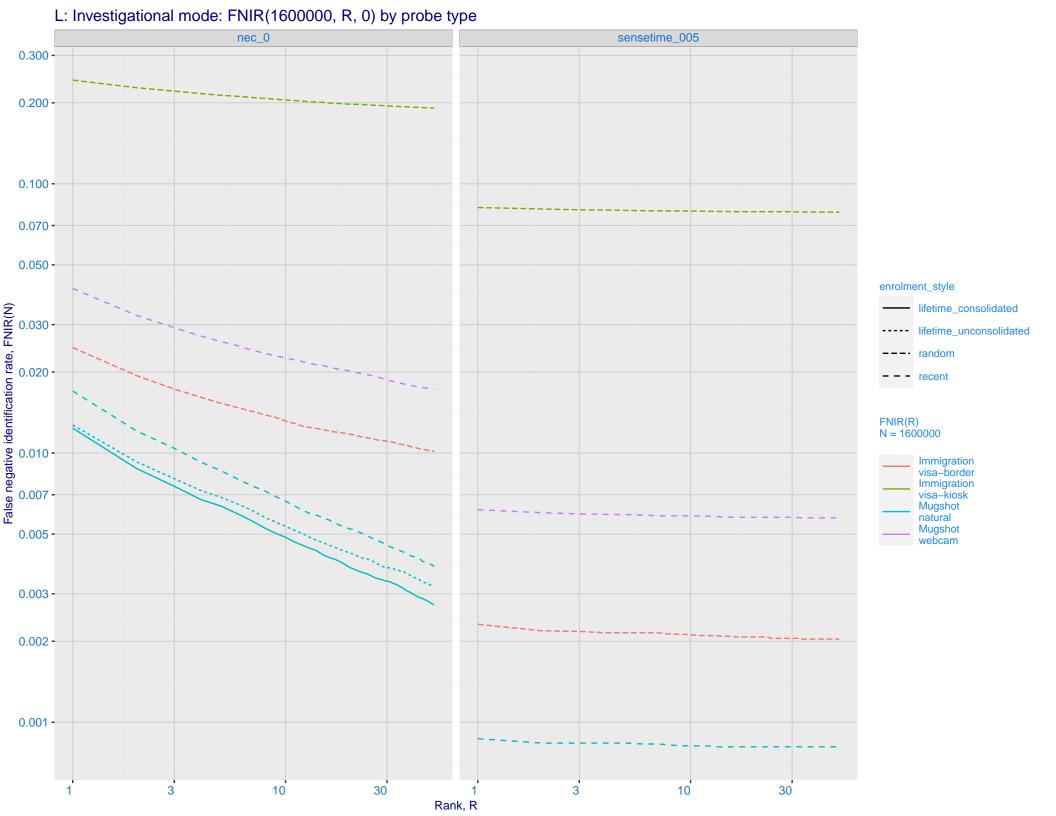


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 - 5e-02 - 3e-02 - 2e-02 - 1e-02 - 7-00 **Enrolled images:** recent N = 1600000 Mugshot natural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

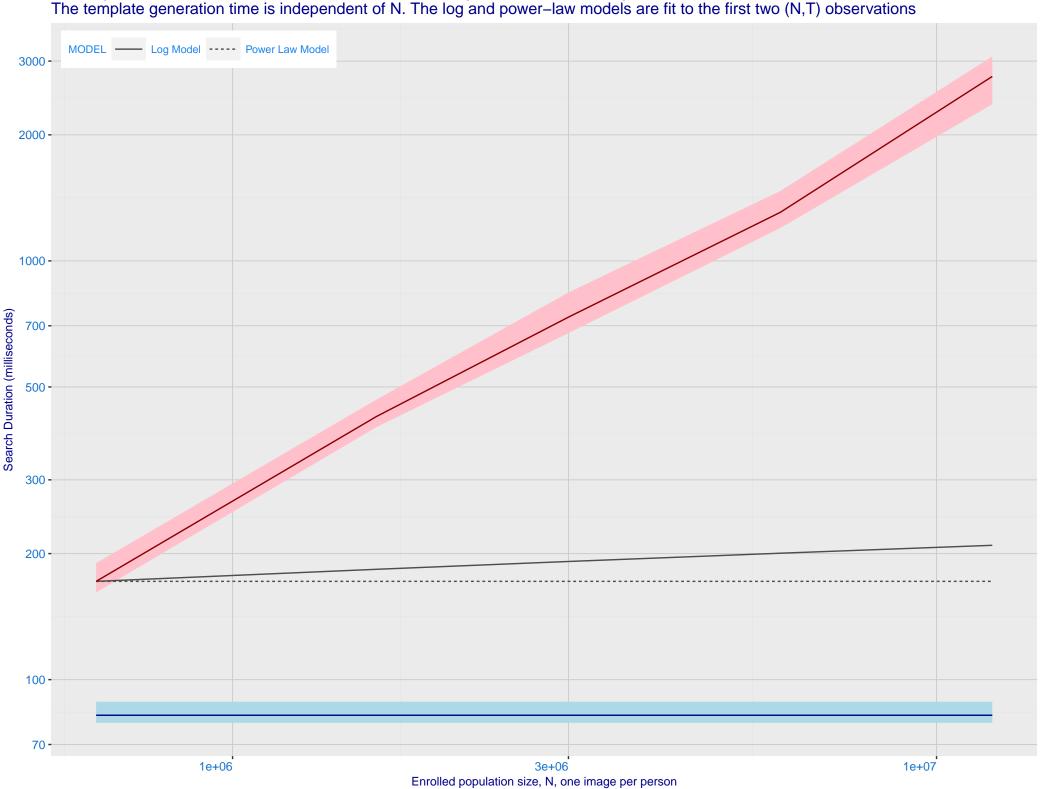




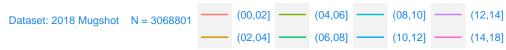
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Palse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.300 - 0.200 - 0.100 - 0.070 - 0. enrolment_style consolidated ---- random --- recent - - - unconsolidated Mugshot Mugshot webcam natural FNIR@Rank = 1 ____ nec_0 - sensetime_005 0.050 -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

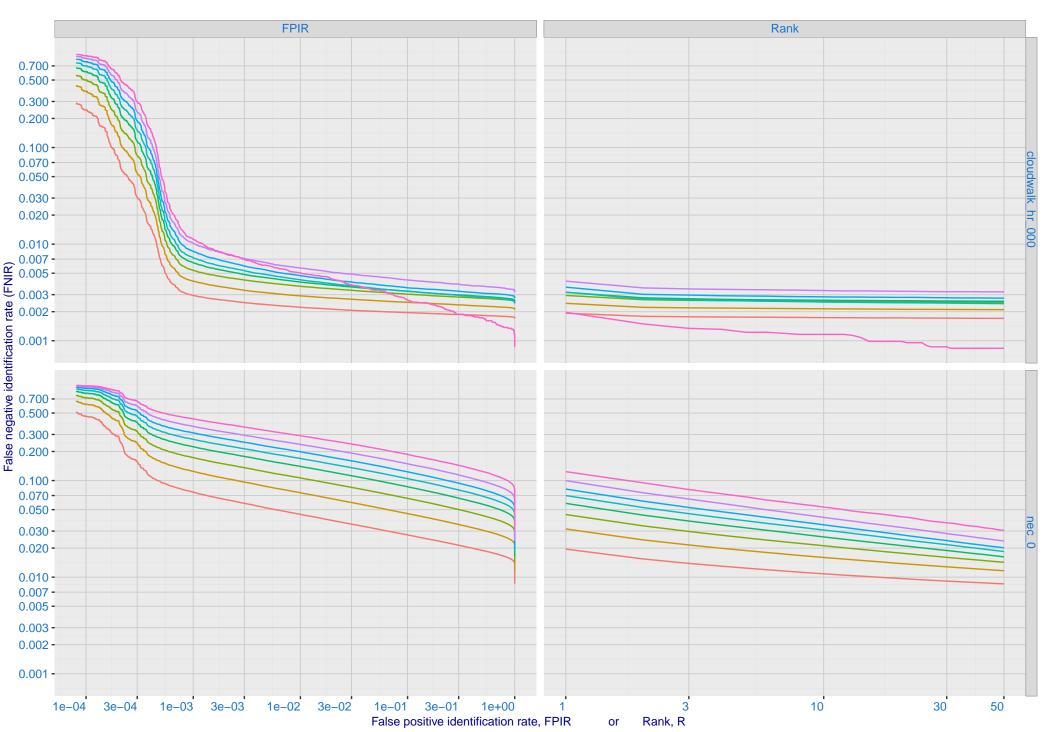


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations



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 0.8 -Dataset: 2018 Mugshot N= 3.1M Color encodes FNIR (Rank = 1) 0.15 0.7 -0.10 0.05 0.00 **TVAL** 0.6 -- FPIR = 0.001 FPIR = 0.003 FPIR = 0.010FPIR = 0.030 0.5 -(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)