A: Datasheet

Algorithm: lookman_3

Developer: Lookman Electroplast Industries

Submission Date: 2018_10_28

Template size: 292 bytes

Template time (2.5 percentile): 334 msec

Template time (median): 336 msec

Template time (97.5 percentile): 367 msec

Investigation:

Frontal mugshot ranking 128 (out of 279) -- FNIR(1600000, 0, 1) = 0.0088 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 140 (out of 241) -- FNIR(1600000, 0, 1) = 0.0379 vs. lowest 0.0062 from sensetime_005

Immigration visa-border ranking 104 (out of 168) -- FNIR(1600000, 0, 1) = 0.0351 vs. lowest 0.0013 from visionlabs_010

 $Immigration\ visa-kiosk\ ranking\ 103\ (out\ of\ 165)\ --\ FNIR(1600000,\ 0,\ 1)=0.2394\ \ vs.\ lowest\ 0.0568\ from\ cloudwalk_hr_000$

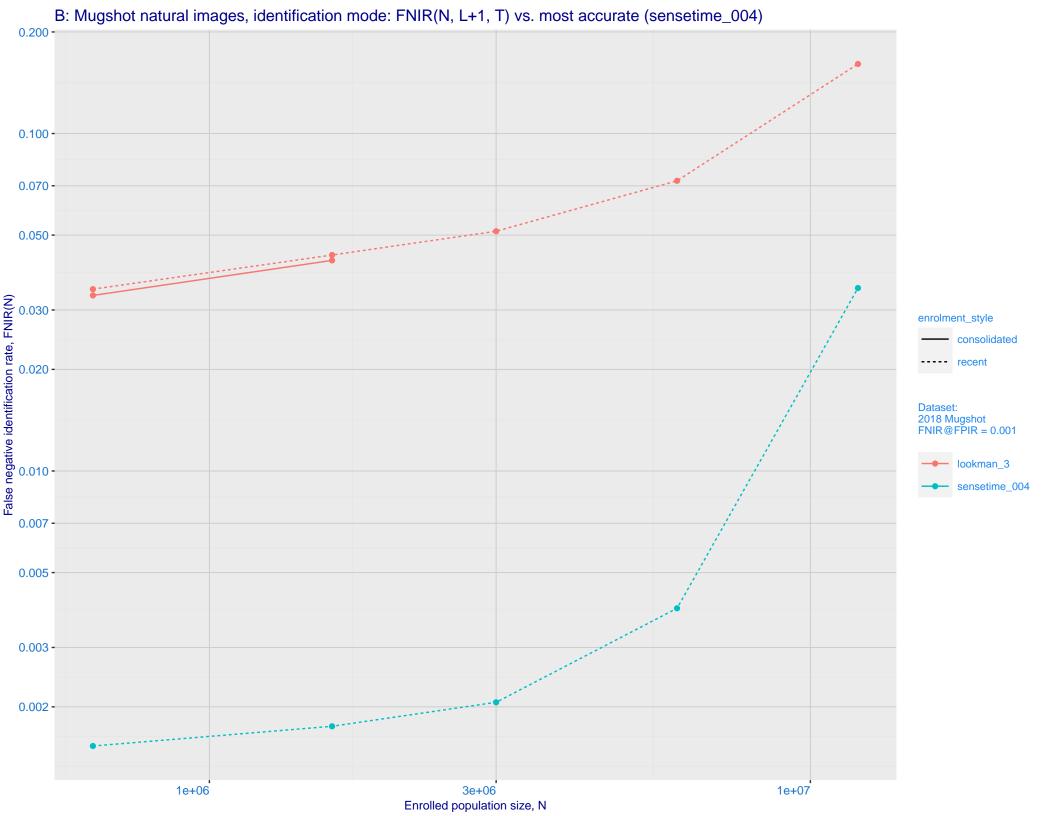
Identification:

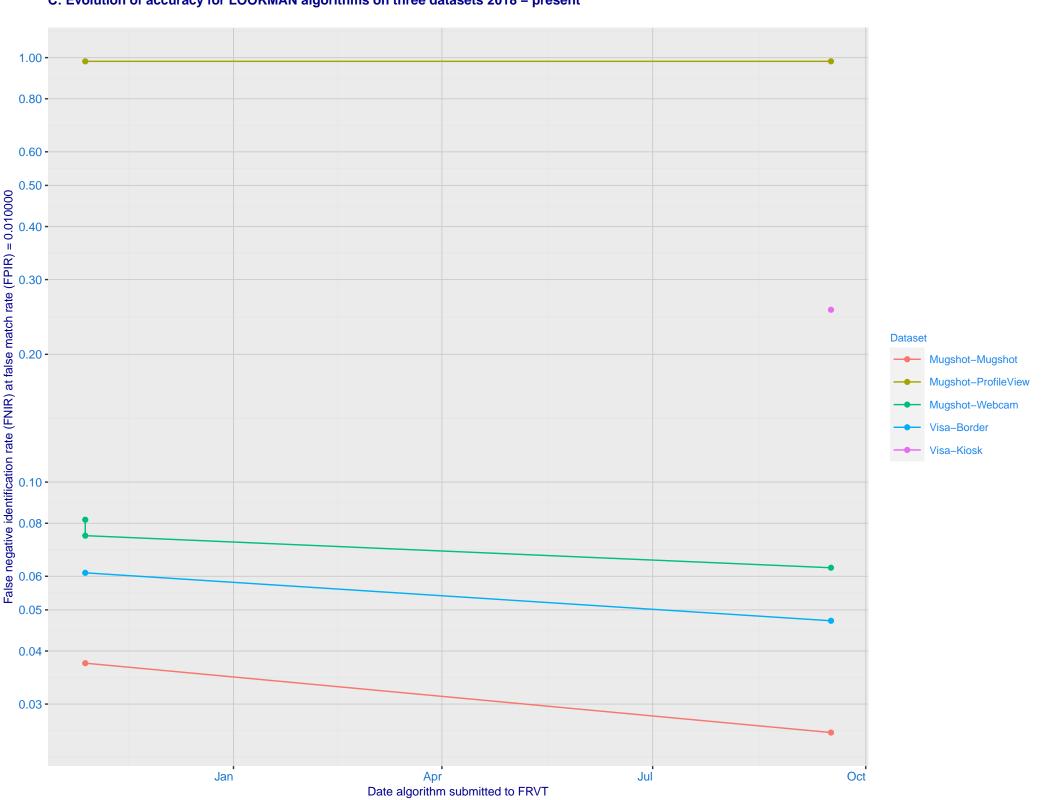
Frontal mugshot ranking 78 (out of 279) -- FNIR(1600000, T, L+1) = 0.0437, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 84 (out of 236) -- FNIR(1600000, T, L+1) = 0.1123, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Immigration visa-border ranking 77 (out of 167) -- FNIR(1600000, T, L+1) = 0.0841, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 55 (out of 162) -- FNIR(1600000, T, L+1) = 0.3572, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

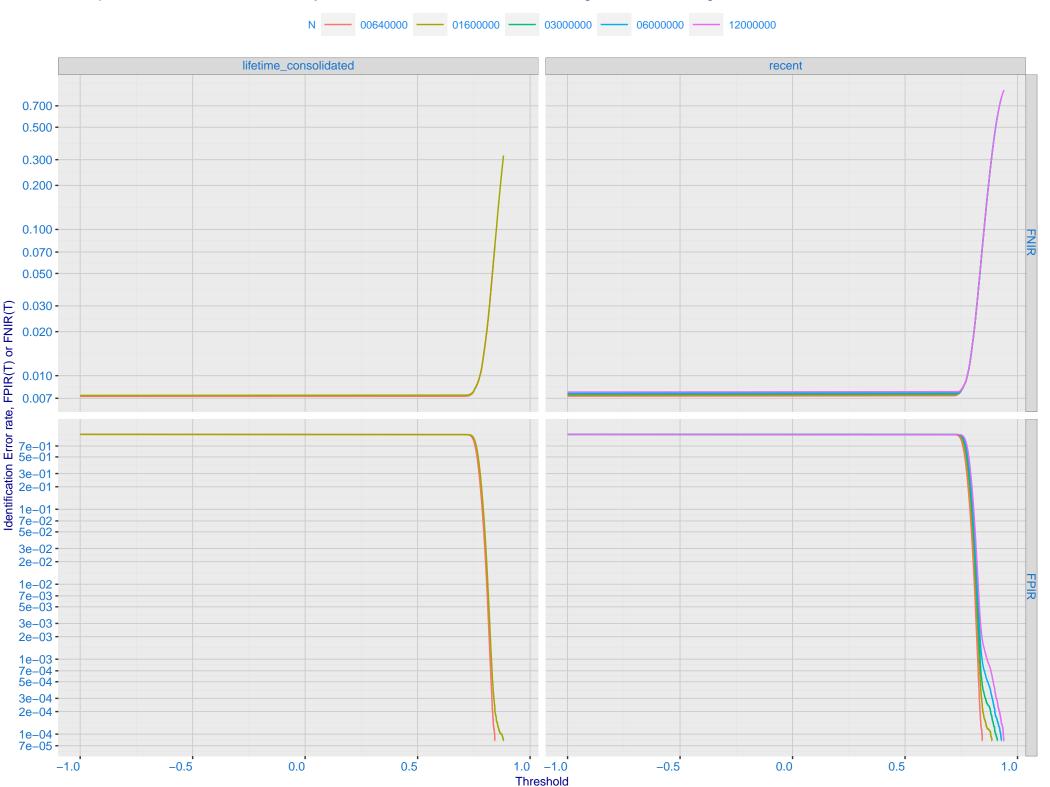




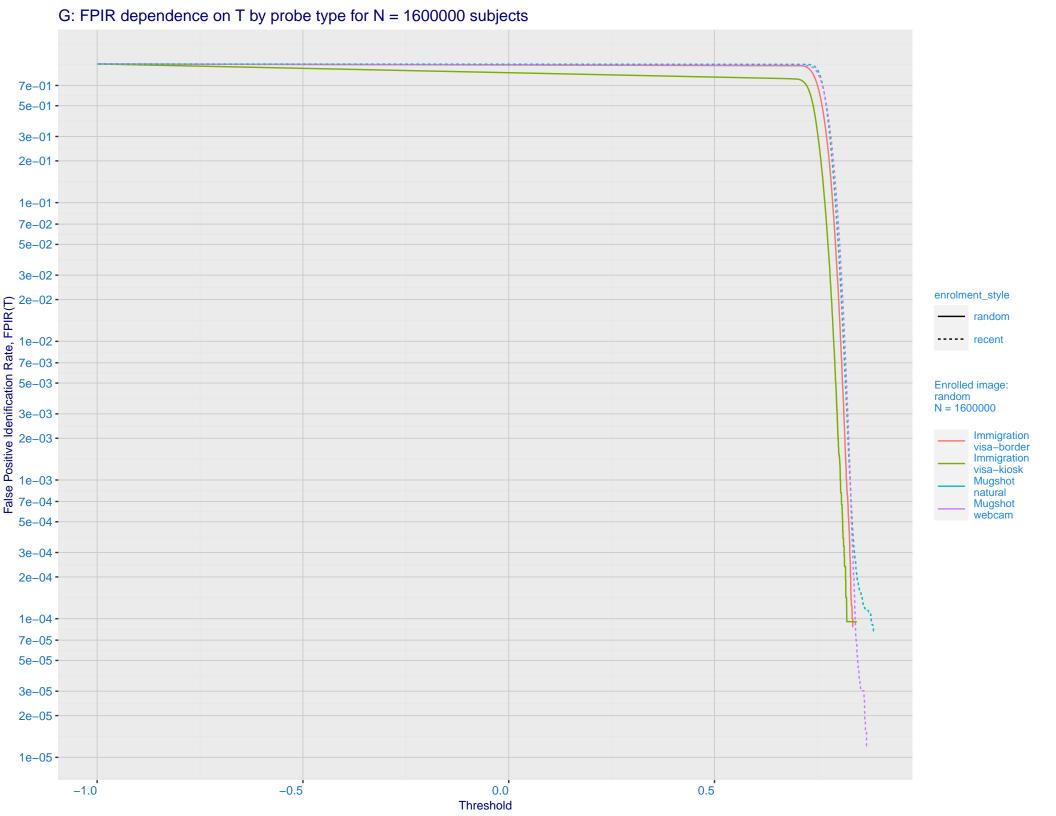
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -Ealse negative identification rate, FNIR(T) 0.003 - 0.000 - 0.500 - 0.500 - 0.200 - 0.100 - 0. enrolment_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.070 -0.050 sensetime 004 0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

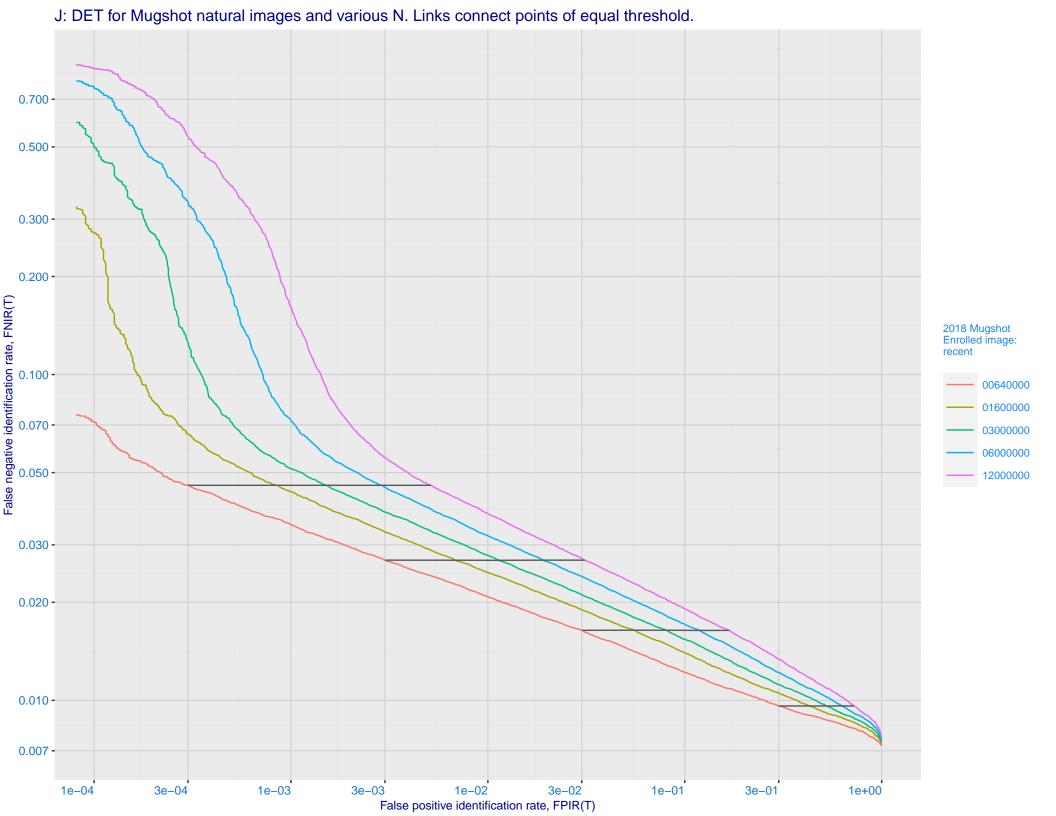
False positive identification rate, FPIR(T)

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

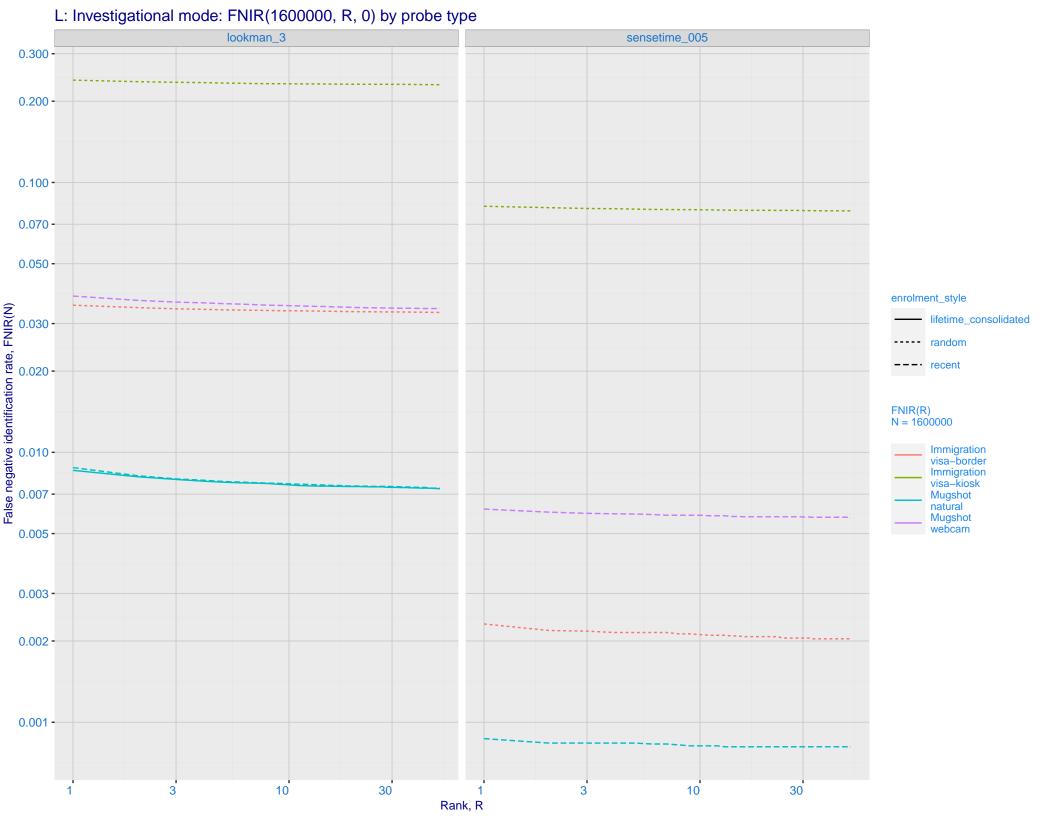


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -1e-02 -**Enrolled images:** recent N = 1600000 Mugshot natural Mugshot webcam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

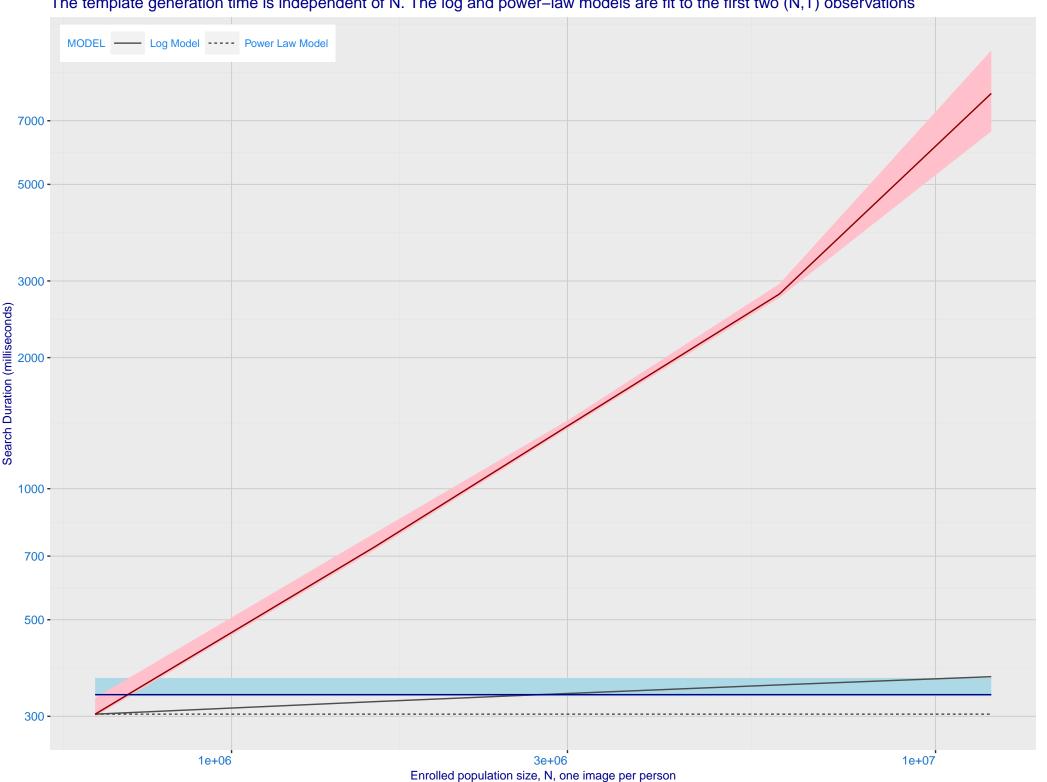




K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -Palse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.300 - 0.200 - 0.100 - 0.070 - 0. enrolment_style consolidated ---- random --- recent Mugshot Mugshot webcam natural FNIR@Rank = 1 lookman_3 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

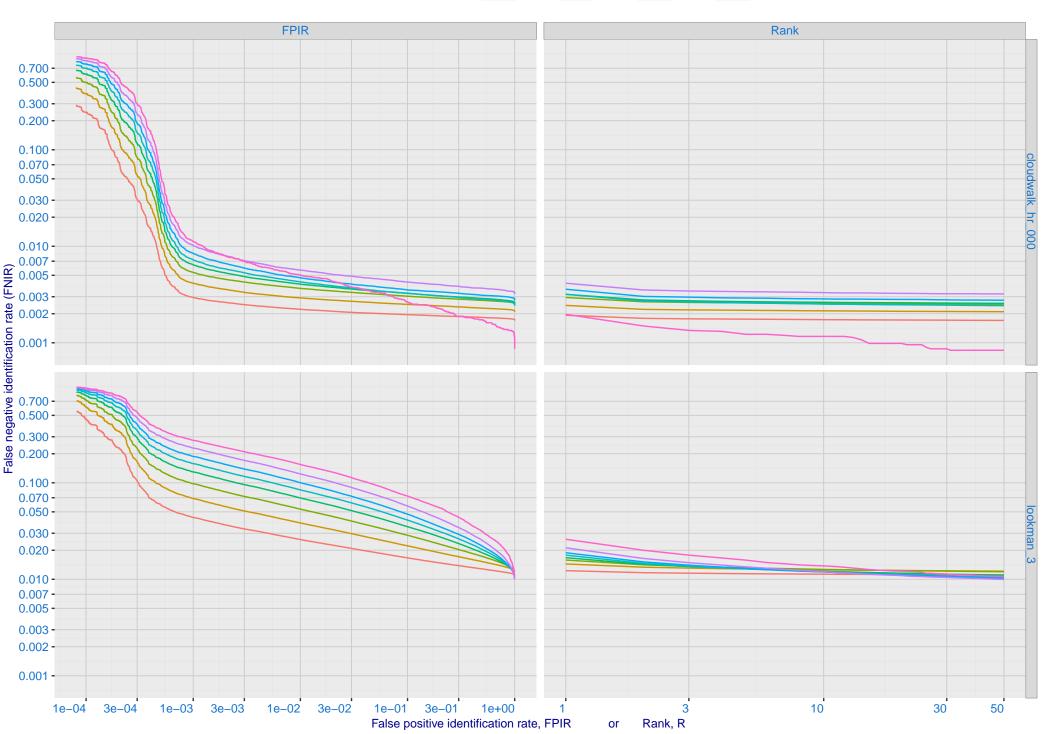


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations



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 1.0 -Dataset: 2018 Mugshot N = 3.1MColor encodes FNIR (Rank = 1) 0.20 0.5 -0.15 0.10 0.05 Score - 0.0 0.00 **TVAL** - FPIR = 0.001 FPIR = 0.003 FPIR = 0.010 -0.5 -FPIR = 0.030 -1.0 -(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)