## A: Datasheet

Algorithm: synesis\_005

Developer: Synesis

Submission Date: 2020\_09\_08

Template size: 4104 bytes

Template time (2.5 percentile): 754 msec

Template time (median): 757 msec

Template time (97.5 percentile): 808 msec

Investigation:

Frontal mugshot ranking 172 (out of 329) -- FNIR(1600000, 0, 1) = 0.0085 vs. lowest 0.0009 from sensetime\_006

Mugshot webcam ranking 68 (out of 291) -- FNIR(1600000, 0, 1) = 0.0127 vs. lowest 0.0057 from sensetime\_006

Mugshot profile ranking 140 (out of 260) — FNIR(1600000, 0, 1) = 0.7441 vs. lowest 0.0550 from sensetime\_006

Immigration visa-border ranking 46 (out of 218) -- FNIR(1600000, 0, 1) = 0.0032 vs. lowest 0.0009 from sensetime\_006

Immigration visa-kiosk ranking 48 (out of 215) -- FNIR(1600000, 0, 1) = 0.0923 vs. lowest 0.0487 from cubox\_000

Identification:

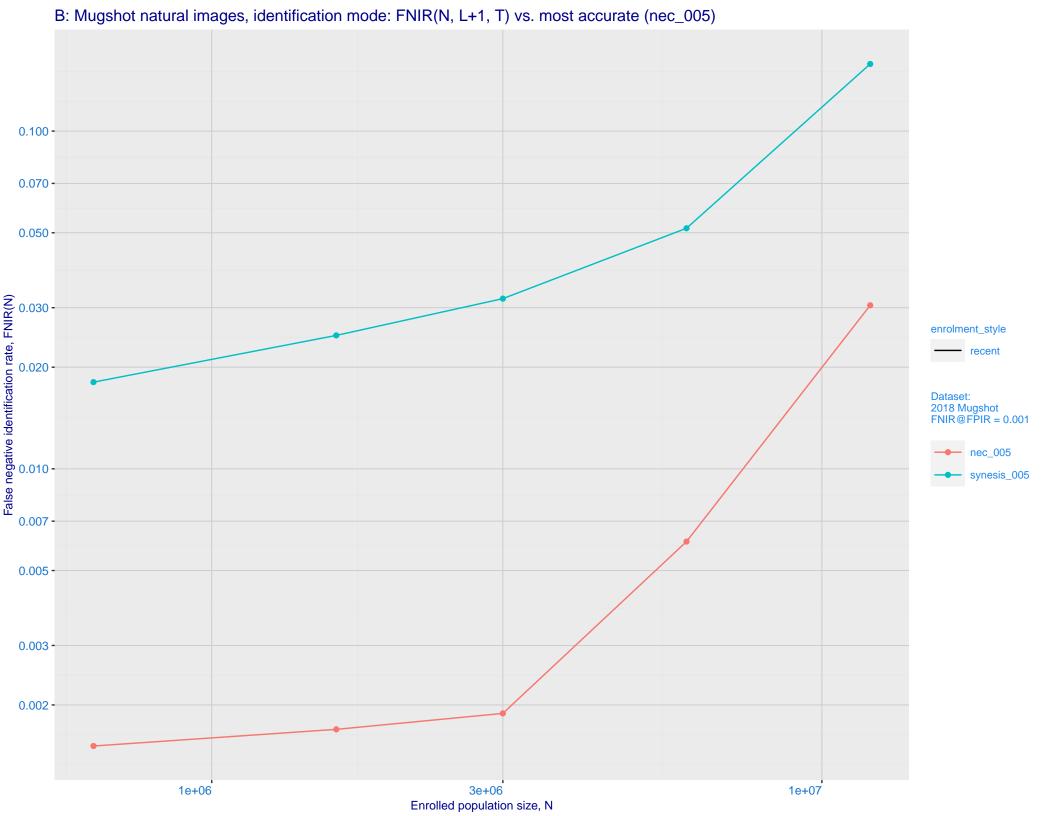
Frontal mugshot ranking 85 (out of 329) -- FNIR(1600000, T, L+1) = 0.0248, FPIR=0.001000 vs. lowest 0.0017 from nec\_005

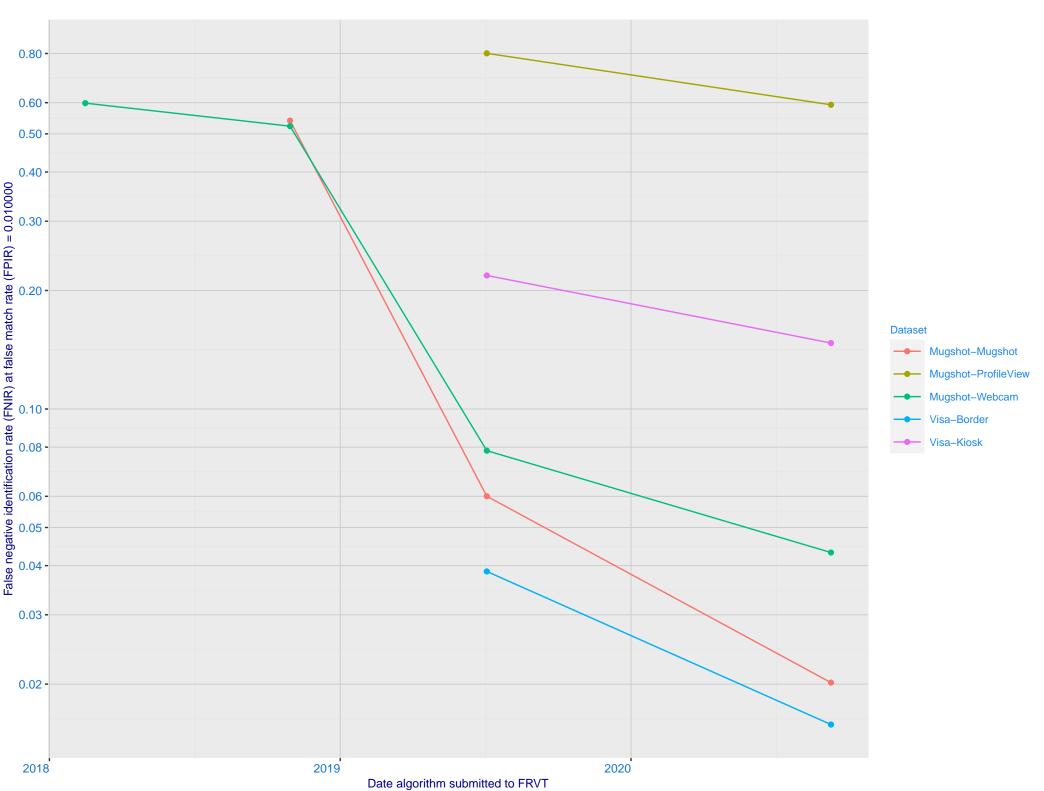
Mugshot webcam ranking 82 (out of 289) -- FNIR(1600000, T, L+1) = 0.0714, FPIR=0.001000 vs. lowest 0.0120 from nec\_005

Mugshot profile ranking 94 (out of 259) — FNIR(1600000, T, L+1) = 0.9837, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk\_hr\_000

Immigration visa-border ranking 71 (out of 217) -- FNIR(1600000, T, L+1) = 0.0325, FPIR=0.001000 vs. lowest 0.0032 from paravision\_009

Immigration visa-kiosk ranking 50 (out of 212) -- FNIR(1600000, T, L+1) = 0.2160, FPIR=0.001000 vs. lowest 0.0728 from paravision\_009

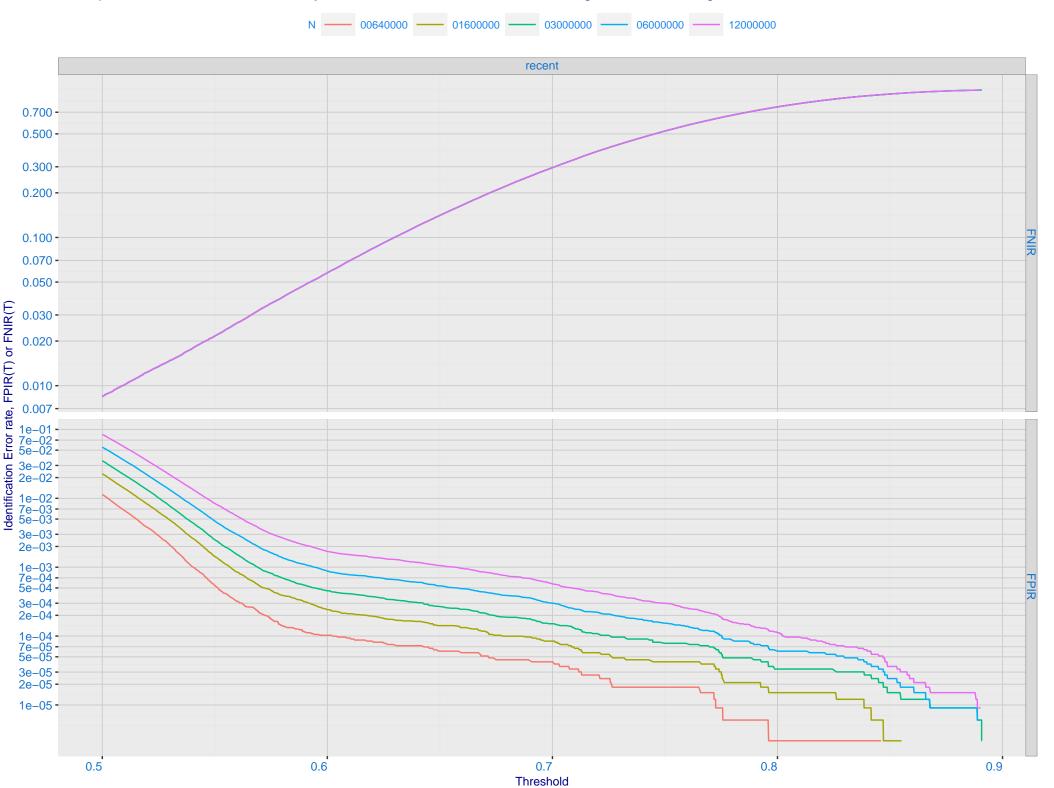




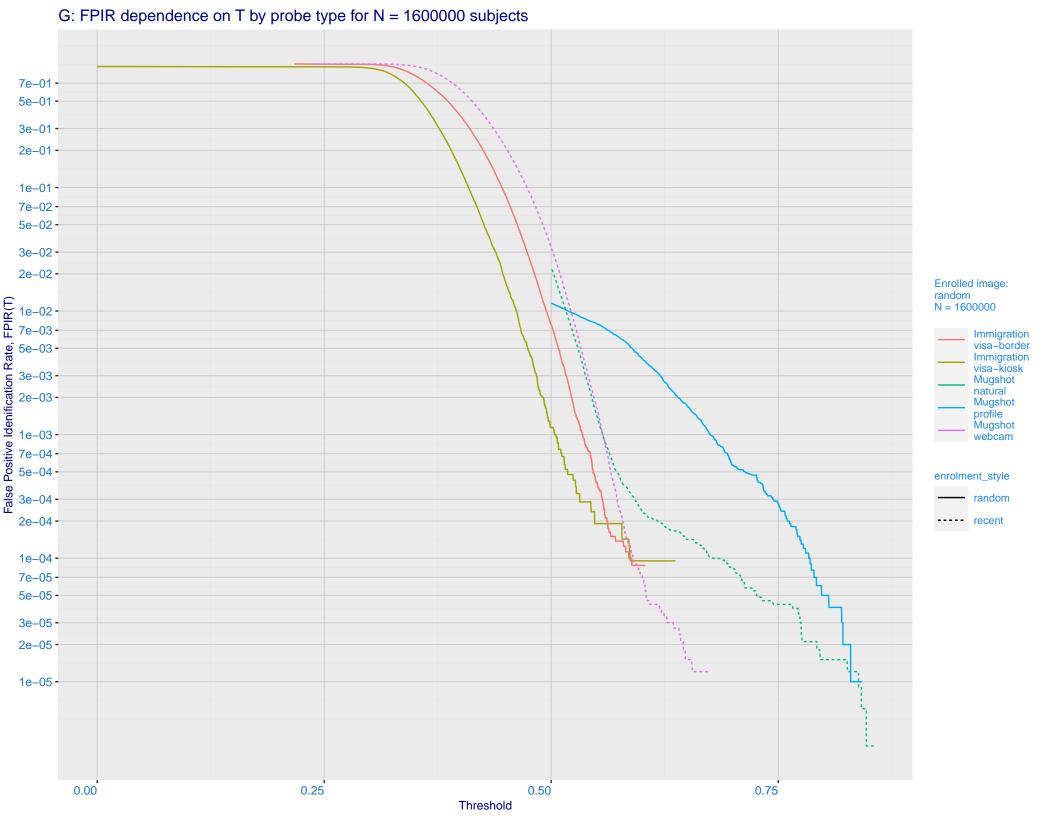
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration Immigration Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -Ealse negative identification rate, FNIR(T) 0.003 - 0.002 - 0.001 - 0.700 - 0.500 - 0.200 - 0. enrolment\_style random-ONE-MATE recent-ONE-MATE 0.100 -0.070 synesis 005 0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

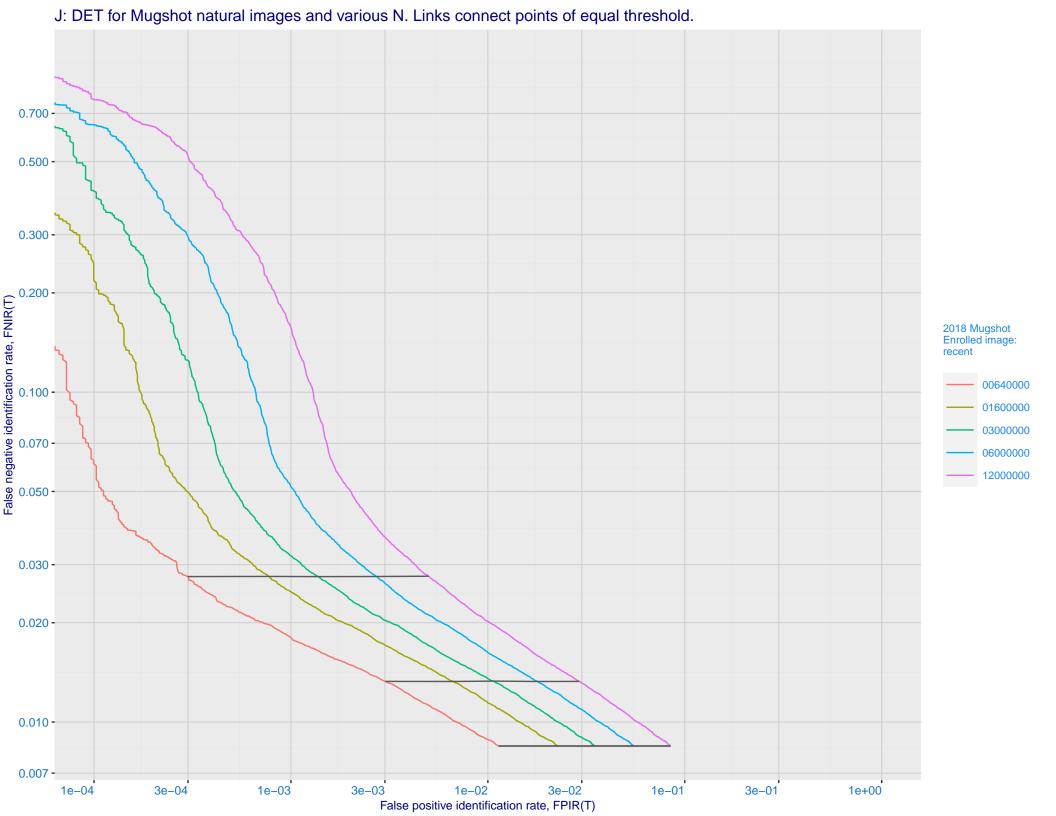
False positive identification rate, FPIR(T)

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

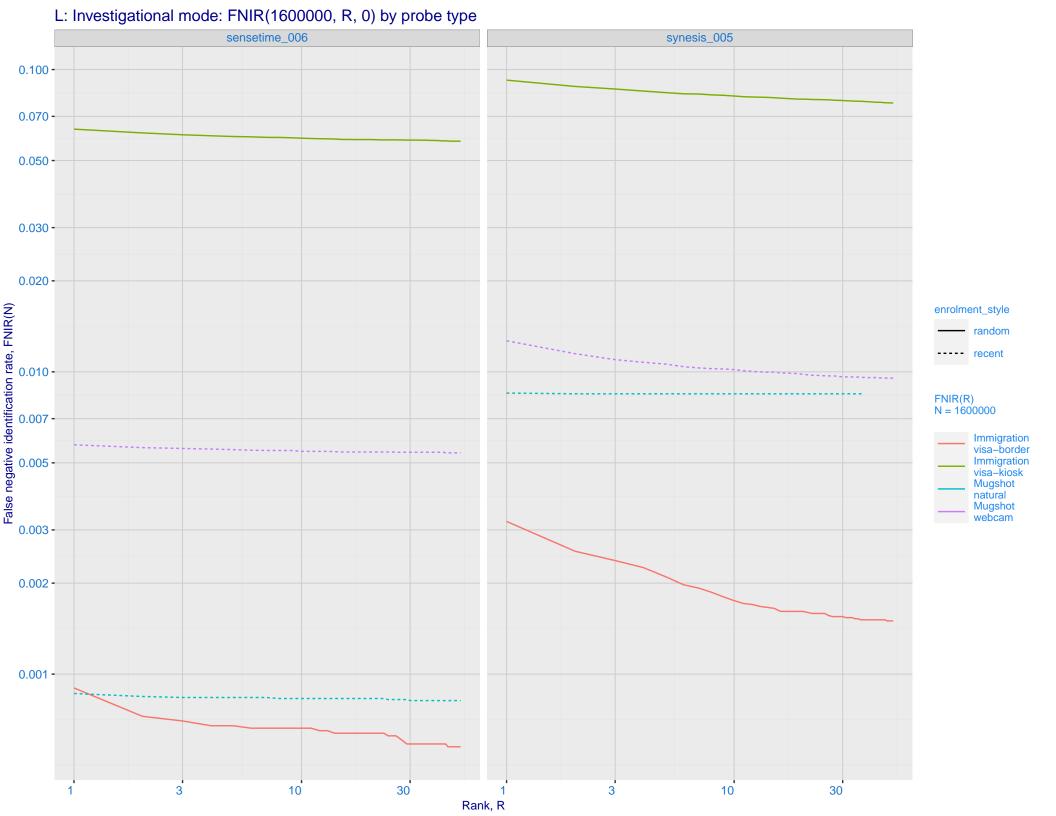


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate 7e+01 -5e+01 -3e+01 -2e+01 -1e+01 -7e+00 -5e+00 -3e+00 -2e+00 -1e+00 -7e-01 -5e-01 -3e-01 -2e-01 -1e-01 -7e-02 -5e-02 -3e-02 -3e-02 -3e-02 -3e-02 -3e-02 -3e-02 -3e-03 -3e-**Enrolled images:** recent N = 1600000Mugshot natural Mugshot webcam 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)

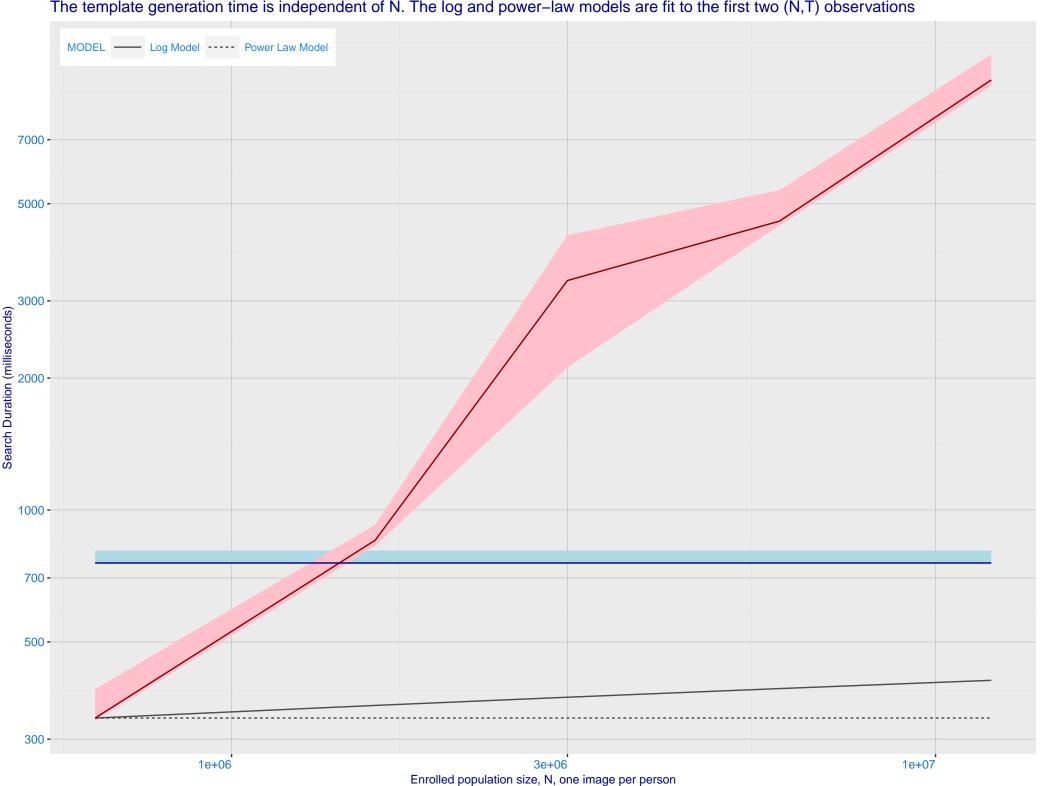




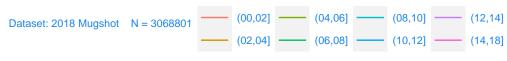
K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime\_006) Immigration **Immigration** visa-border visa-kiosk 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -Ealse negative identification rate, FNIR(N) 0.002 - 0.001 - 0.000 - 0.050 - 0.030 - 0. FNIR@Rank = 1 sensetime\_006 synesis\_005 Mugshot Mugshot webcam natural enrolment\_style random ---- recent 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

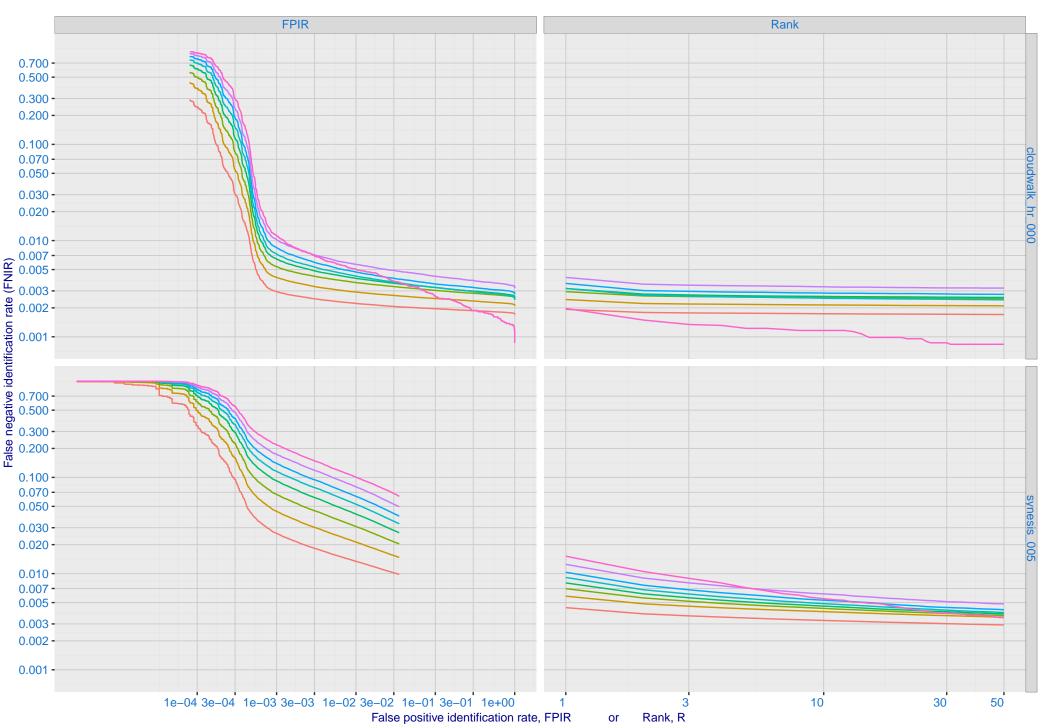


M: Template duration; search duration vs. N. The blue and pink ribbon covers 95 percent of observed measurements. The template generation time is independent of N. The log and power–law models are fit to the first two (N,T) observations



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) 0.8 -0.15 0.10 0.05 0.00 TVAL - FPIR = 0.001 - FPIR = 0.003 FPIR = 0.0100.4 -FPIR = 0.030 0.2 -(04,06] (00,02](02,04](06,08](08,10](10,12](12,14](14,18]Time lapse between search and initial encounter enrollment (years)