A: Datasheet

Algorithm: neurotechnology_007

Developer: Neurotechnology

Submission Date: 2019_10_03

Template size: 256 bytes

Template time (2.5 percentile): 161 msec

Template time (median): 161 msec

Template time (97.5 percentile): 233 msec

Investigation:

Frontal mugshot ranking 116 (out of 329) -- FNIR(1600000, 0, 1) = 0.0039 vs. lowest 0.0009 from sensetime_006

Mugshot webcam ranking 134 (out of 291) -- FNIR(1600000, 0, 1) = 0.0213 vs. lowest 0.0057 from sensetime_006

Mugshot profile ranking 153 (out of 260) — FNIR(1600000, 0, 1) = 0.7965 vs. lowest 0.0550 from sensetime_006

Immigration visa-border ranking 109 (out of 218) -- FNIR(1600000, 0, 1) = 0.0090 vs. lowest 0.0009 from sensetime_006

Immigration visa-kiosk ranking 135 (out of 215) -- FNIR(1600000, 0, 1) = 0.1801 vs. lowest 0.0487 from cubox_000

Identification:

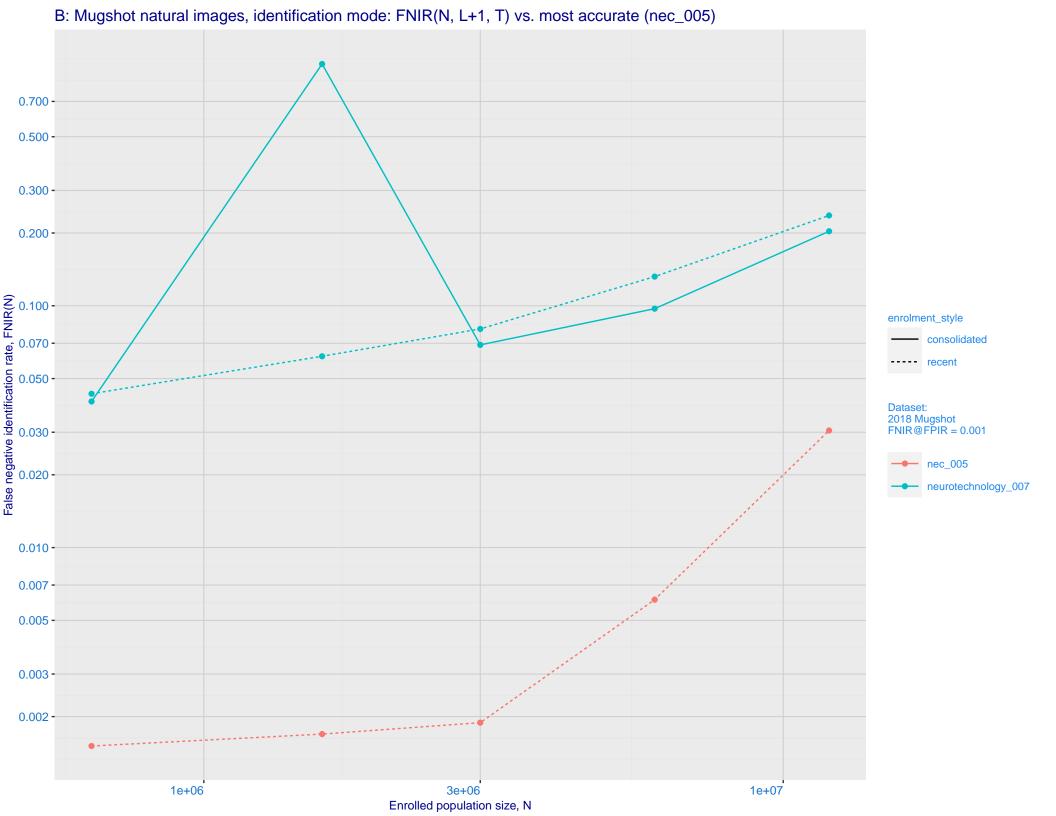
Frontal mugshot ranking 158 (out of 329) -- FNIR(1600000, T, L+1) = 0.0618, FPIR=0.001000 vs. lowest 0.0017 from nec_005

Mugshot webcam ranking 175 (out of 289) -- FNIR(1600000, T, L+1) = 0.1684, FPIR=0.001000 vs. lowest 0.0120 from nec_005

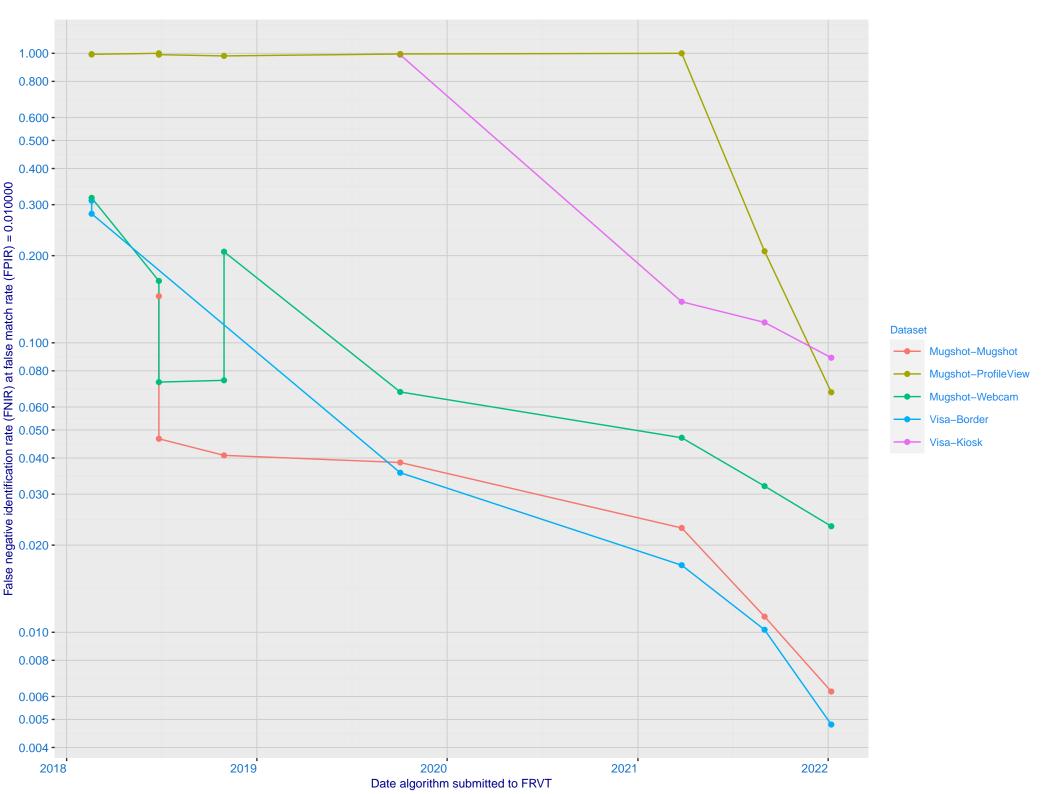
Mugshot profile ranking 206 (out of 259) -- FNIR(1600000, T, L+1) = 0.9998, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 157 (out of 217) -- FNIR(1600000, T, L+1) = 0.3392, FPIR=0.001000 vs. lowest 0.0032 from paravision_009

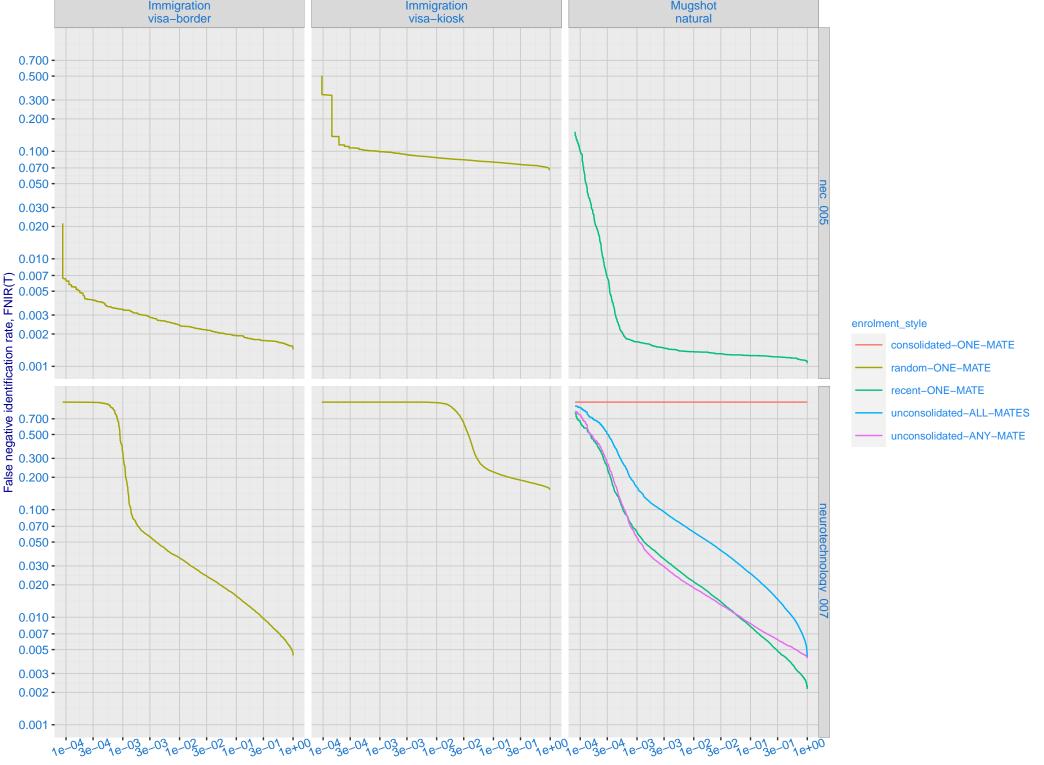
Immigration visa-kiosk ranking 204 (out of 212) -- FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.0728 from paravision_009



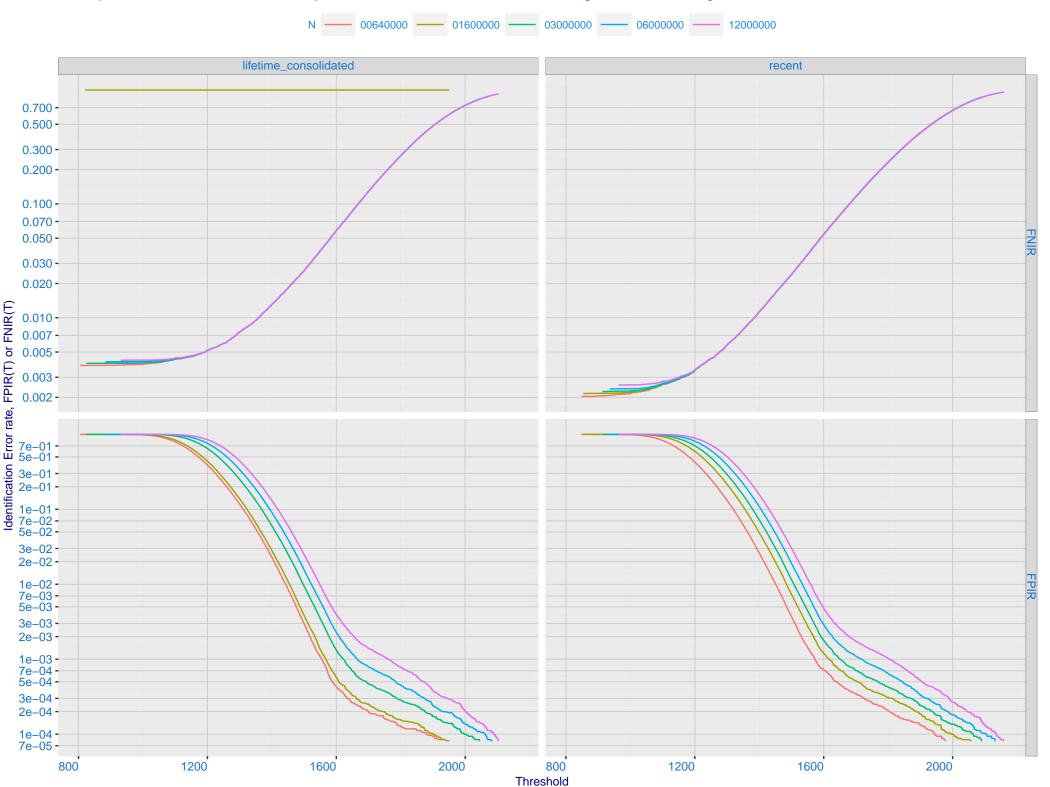
C: Evolution of accuracy for NEUROTECHNOLOGY algorithms on three datasets 2018 – present



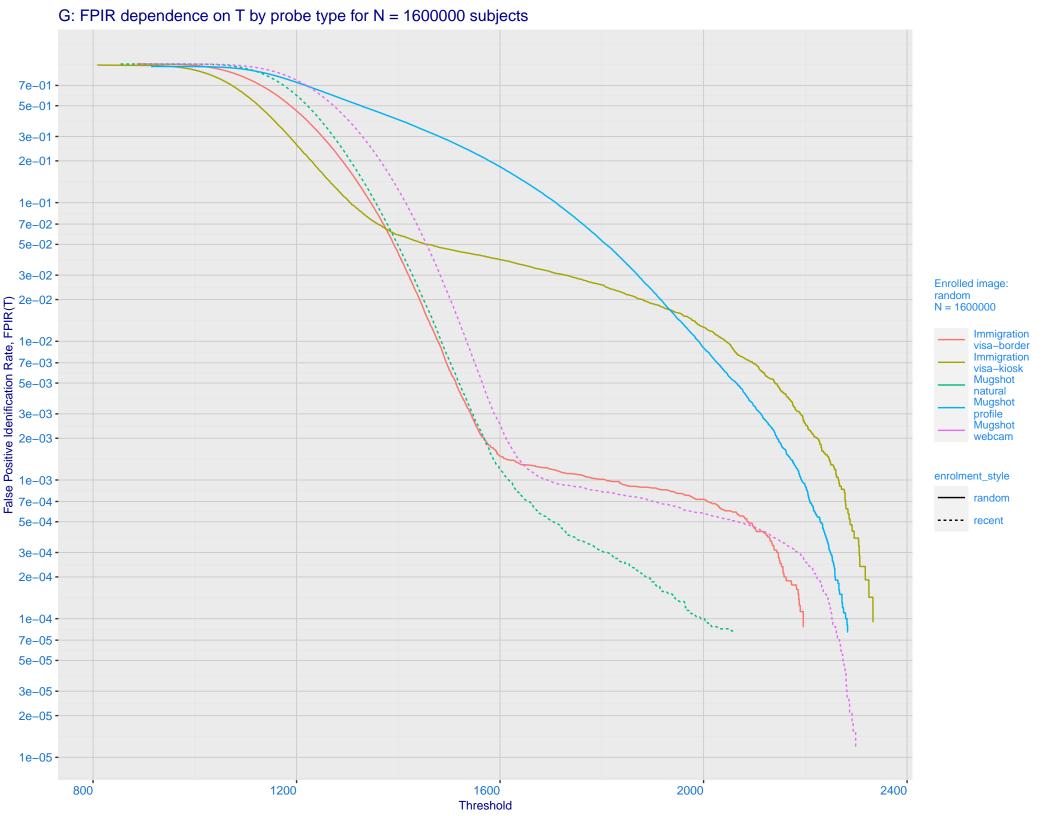
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural

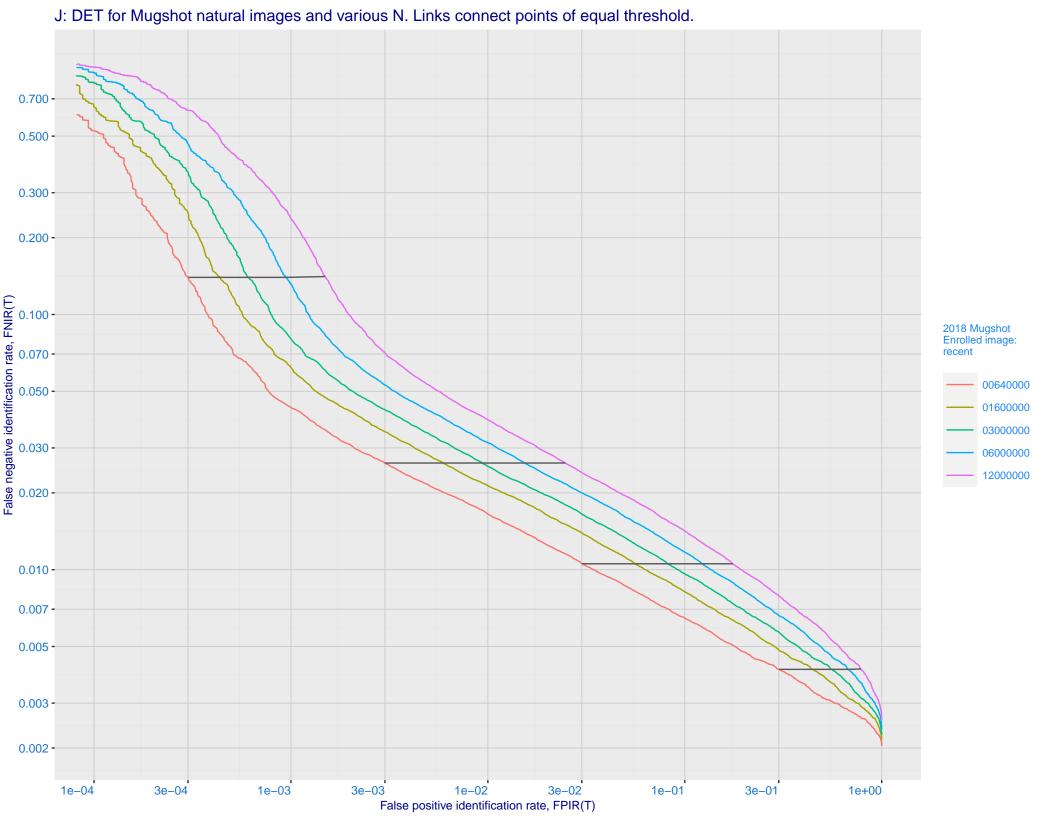


E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images



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)

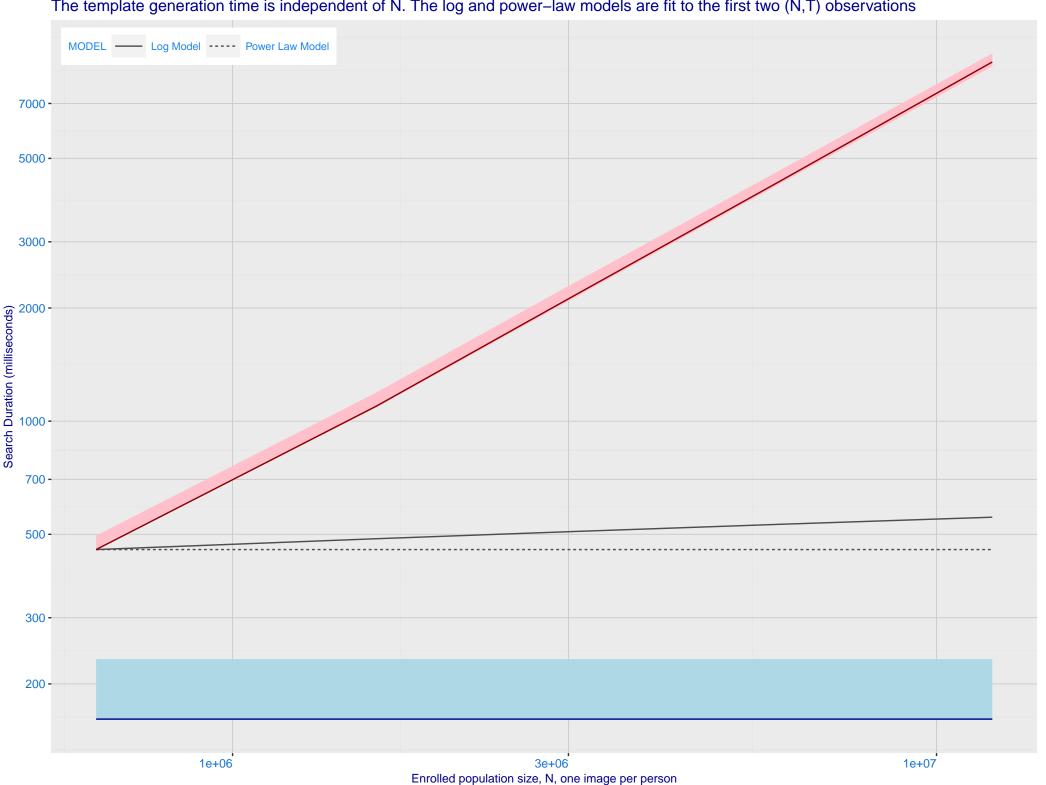




K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_006) Immigration **Immigration** visa-border visa-kiosk 0.700 -0.500 -0.300 -0.200 -• 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 - 0.003 - 0.002 - 0.001 - 0.001 - 0.000 - 0.300 - 0.200 enrolment_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 neurotechnology_007 sensetime_006 0.100 -0.070 -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

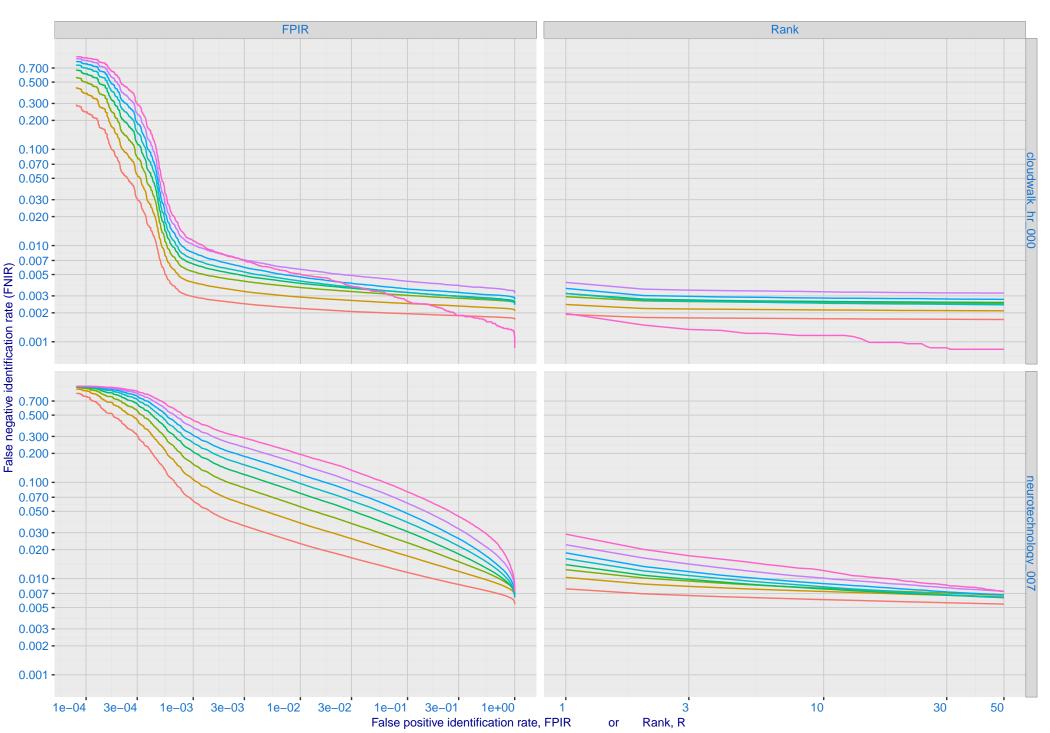
L: Investigational mode: FNIR(1600000, R, 0) by probe type neurotechnology_007 sensetime_006 0.700 -0.500 -0.300 -0.200 -0.100 enrolment_style Ealse negative identification rate, FNIR(N) 0.000 - 0. lifetime_consolidated ---- random --- recent FNIR(R) N = 1600000 Immigration visa-border Immigration visa-kiosk Mugshot natural Mugshot webcam 0.005 -0.003 -0.002 -0.001 -10 30 3 10 30 Rank, R

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 2500 -Dataset: 2018 Mugshot N= 3.1M Color encodes FNIR (Rank = 1) 2000 -0.15 0.10 0.05 0.00 TVAL 1500 -- FPIR = 0.001 FPIR = 0.003 FPIR = 0.010FPIR = 0.030 1000 -

(08,10]

Time lapse between search and initial encounter enrollment (years)

(10,12]

(12,14]

(14,18]

(00,02]

(02,04]

(04,06]

(06,08]