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 77 (out of 279) -- FNIR(1600000, 0, 1) = 0.0039 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 91 (out of 241) -- FNIR(1600000, 0, 1) = 0.0213 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 104 (out of 210) — FNIR(1600000, 0, 1) = 0.7965 vs. lowest 0.0587 from xforwardai_002

Immigration visa-border ranking 68 (out of 168) -- FNIR(1600000, 0, 1) = 0.0090 vs. lowest 0.0013 from visionlabs_010

Immigration visa-kiosk ranking 87 (out of 165) -- FNIR(1600000, 0, 1) = 0.1801 vs. lowest 0.0568 from cloudwalk_hr_000

Identification:

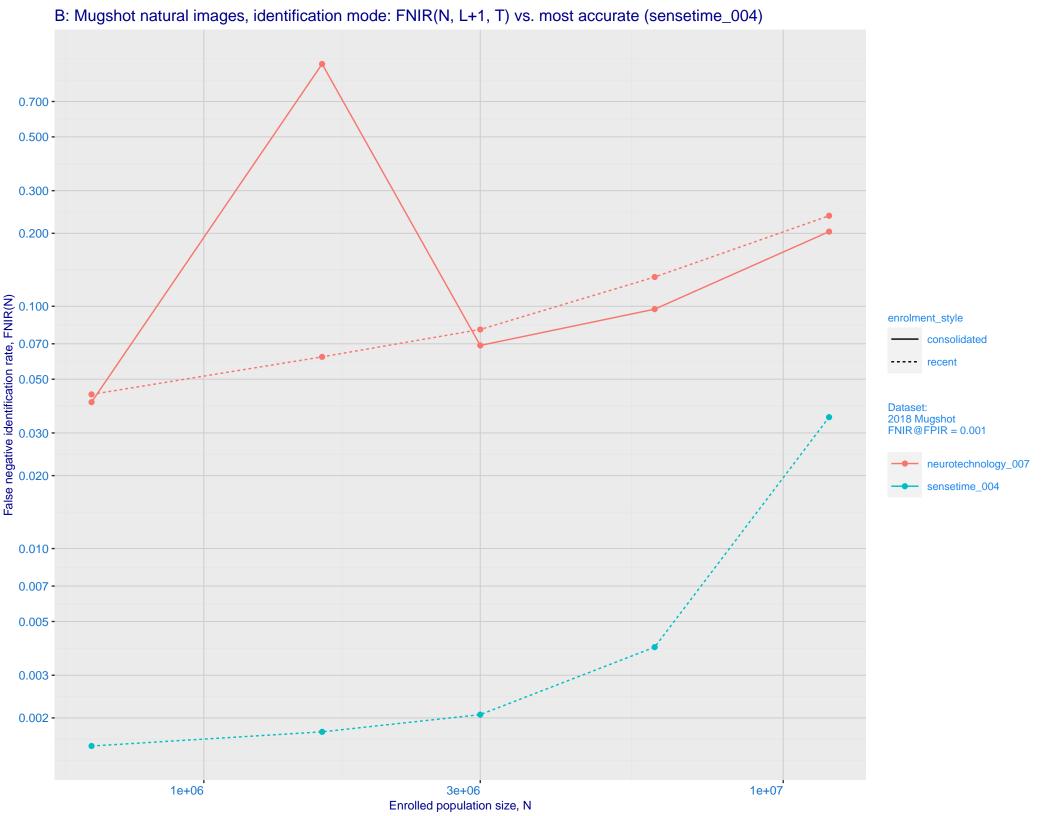
Frontal mugshot ranking 114 (out of 279) -- FNIR(1600000, T, L+1) = 0.0618, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

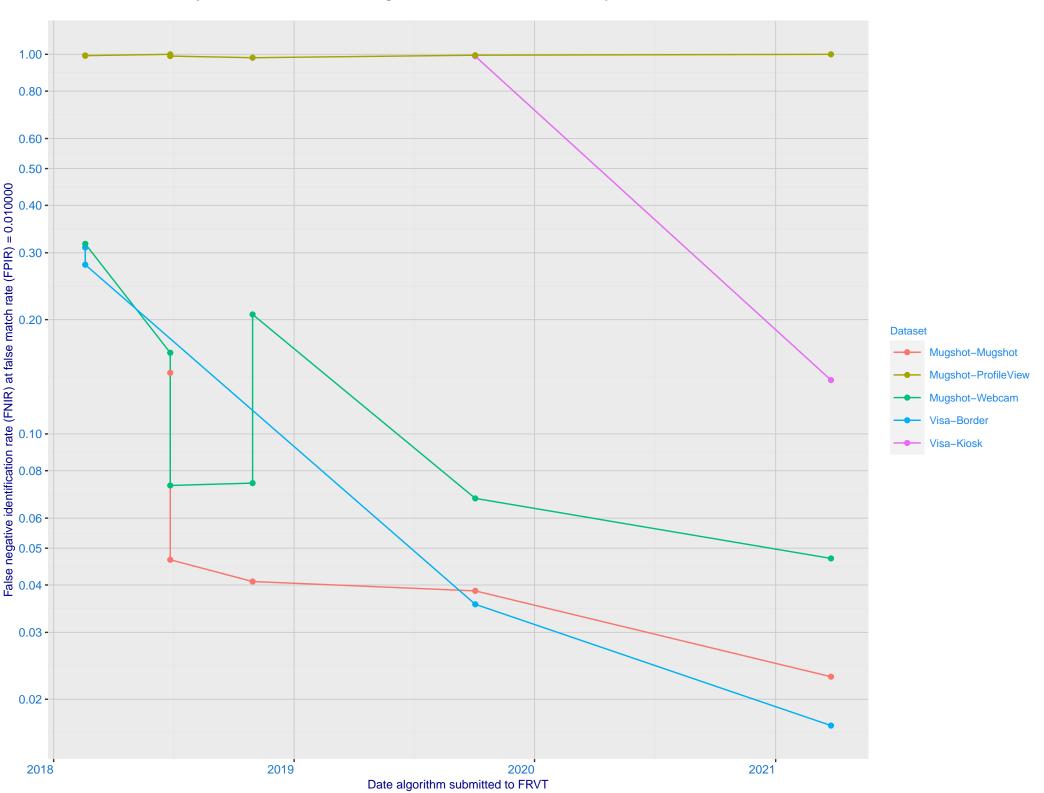
Mugshot webcam ranking 129 (out of 236) -- FNIR(1600000, T, L+1) = 0.1684, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

Mugshot profile ranking 168 (out of 209) -- FNIR(1600000, T, L+1) = 0.9998, FPIR=0.001000 vs. lowest 0.1331 from cloudwalk_hr_000

Immigration visa-border ranking 110 (out of 167) -- FNIR(1600000, T, L+1) = 0.3392, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa-kiosk ranking 154 (out of 162) -- FNIR(1600000, T, L+1) = 1.0000, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

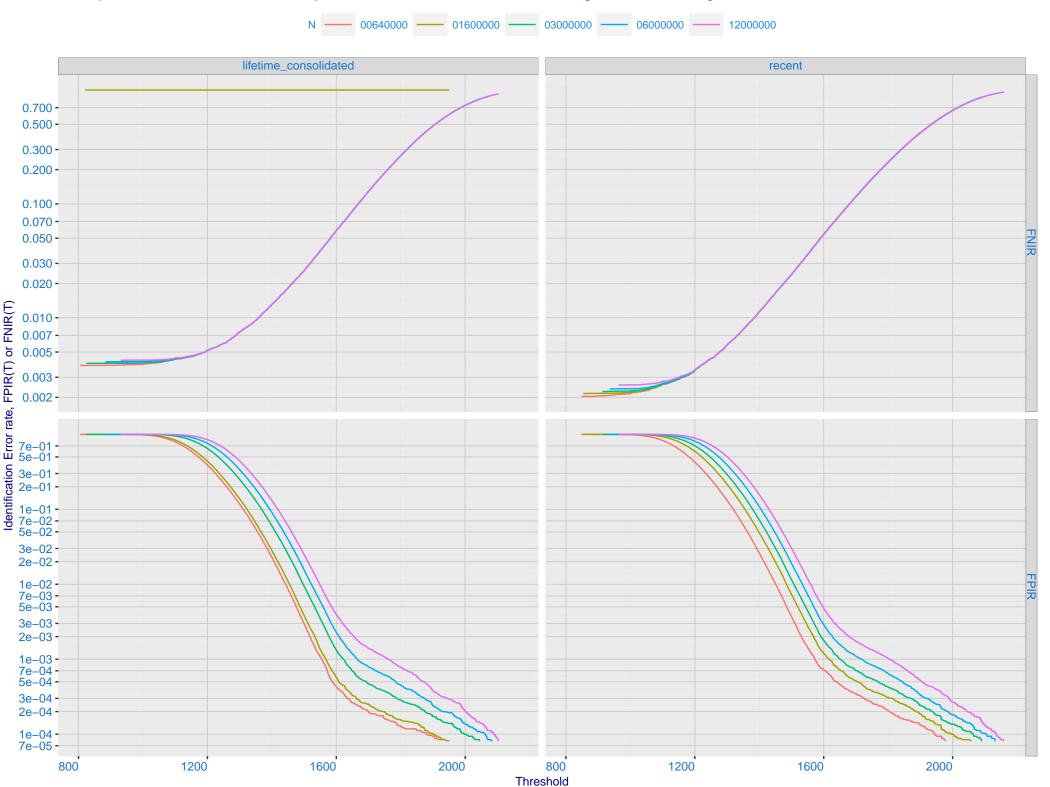




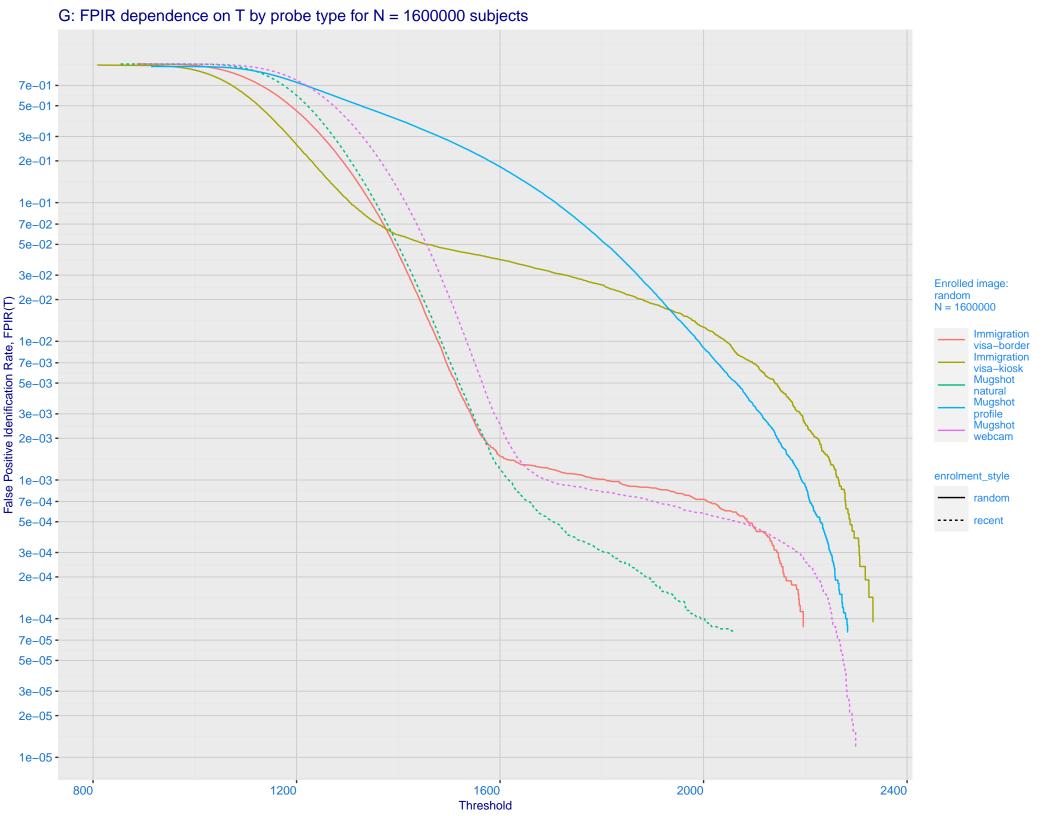
D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals Immigration **Immigration** Mugshot visa-border visa-kiosk natural 0.700 -0.500 -0.300 -0.200 -0.100 neurotechnology 007 0.070 -0.050 -0.030 -0.020 -0.010 -0.007 - 0.005 - 0.005 - 0.002 - 0.001 - 0.001 - 0.700 - 0.500 - 0.200 enrolment_style consolidated-ONE-MATE random-ONE-MATE recent-ONE-MATE unconsolidated-ALL-MATES unconsolidated-ANY-MATE 0.100 -0.070 sensetime 004 0.050 -0.030 -0.020 -0.010 -0.007 -0.005 -0.003 -0.002 -0.001 -

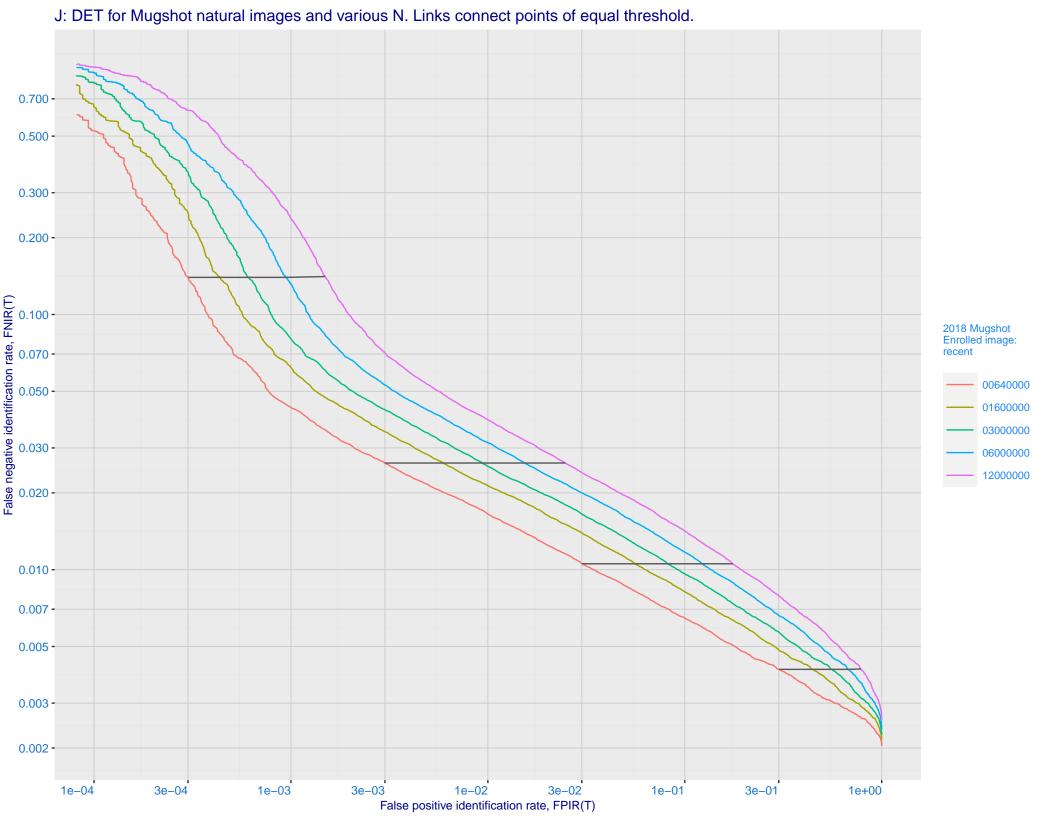
False positive identification rate, FPIR(T)

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 -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)

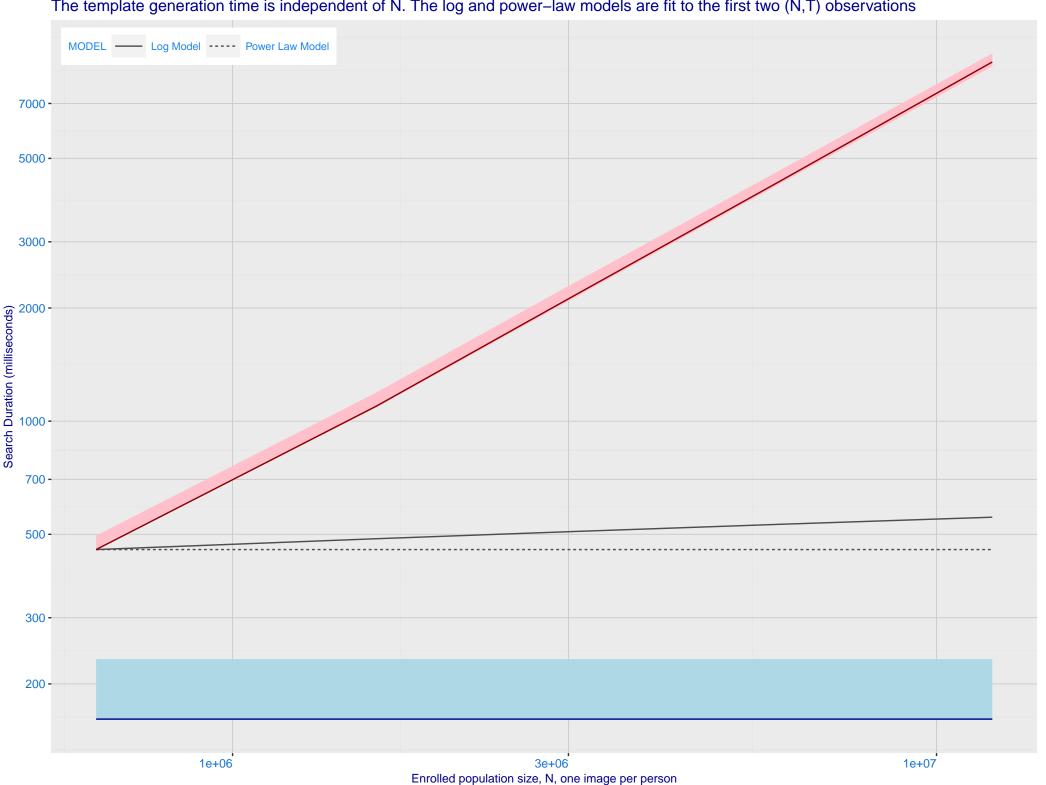




K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005) Immigration **Immigration** visa-border visa-kiosk 0.700 -0.500 -0.300 -0.200 -• 0.100 -0.070 -0.050 -0.030 -0.020 -0.010 -0.007 -0.005 - 0.003 - 0.002 - 0.001 - 0.001 - 0.000 - 0.300 - 0.200 enrolment_style consolidated ---- random --- recent Mugshot webcam Mugshot natural FNIR@Rank = 1 neurotechnology_007 sensetime_005 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

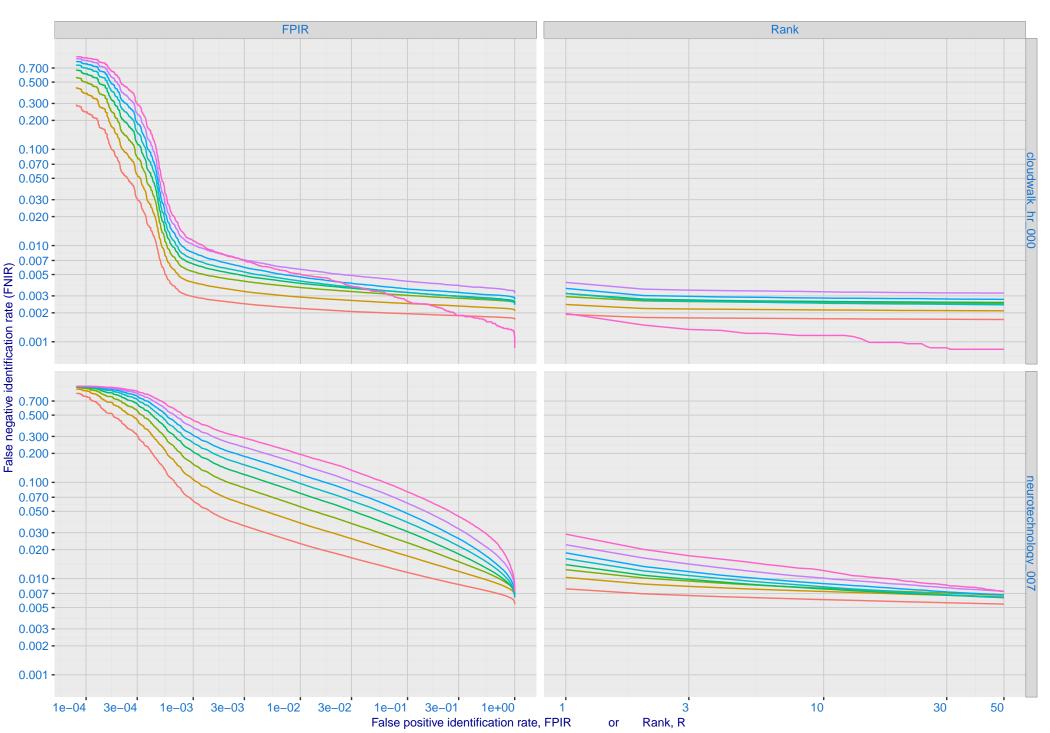
L: Investigational mode: FNIR(1600000, R, 0) by probe type neurotechnology_007 sensetime_005 0.700 -0.500 -0.300 -0.200 -0.100 - 0.070 - 0.050 - 0.030 - 0.020 - 0.010 enrolment_style lifetime_consolidated ---- random --- recent FNIR(R) N = 1600000 Immigration visa-border Immigration visa-kiosk Mugshot natural Mugshot webcam 0.007 -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]