A: Datasheet

Algorithm: veridas_001

Developer: Veridas Digital Authentication Solutions S.L.

Submission Date: 2021_03_05

Template size: 2048 bytes

Template time (2.5 percentile): 859 msec

Template time (median): 873 msec

Template time (97.5 percentile): 898 msec

Investigation:

Frontal mugshot ranking 49 (out of 268) −− FNIR(1600000, 0, 1) = 0.0028 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 38 (out of 230) −− FNIR(1600000, 0, 1) = 0.0140 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 57 (out of 199) −− FNIR(1600000, 0, 1) = 0.5499 vs. lowest 0.0591 from sensetime_005

Immigration visa−border ranking 44 (out of 157) −− FNIR(1600000, 0, 1) = 0.0062 vs. lowest 0.0013 from visionlabs_010

Immigration visa−kiosk ranking 50 (out of 154) −− FNIR(1600000, 0, 1) = 0.1309 vs. lowest 0.0568 from hr_000

Identification:

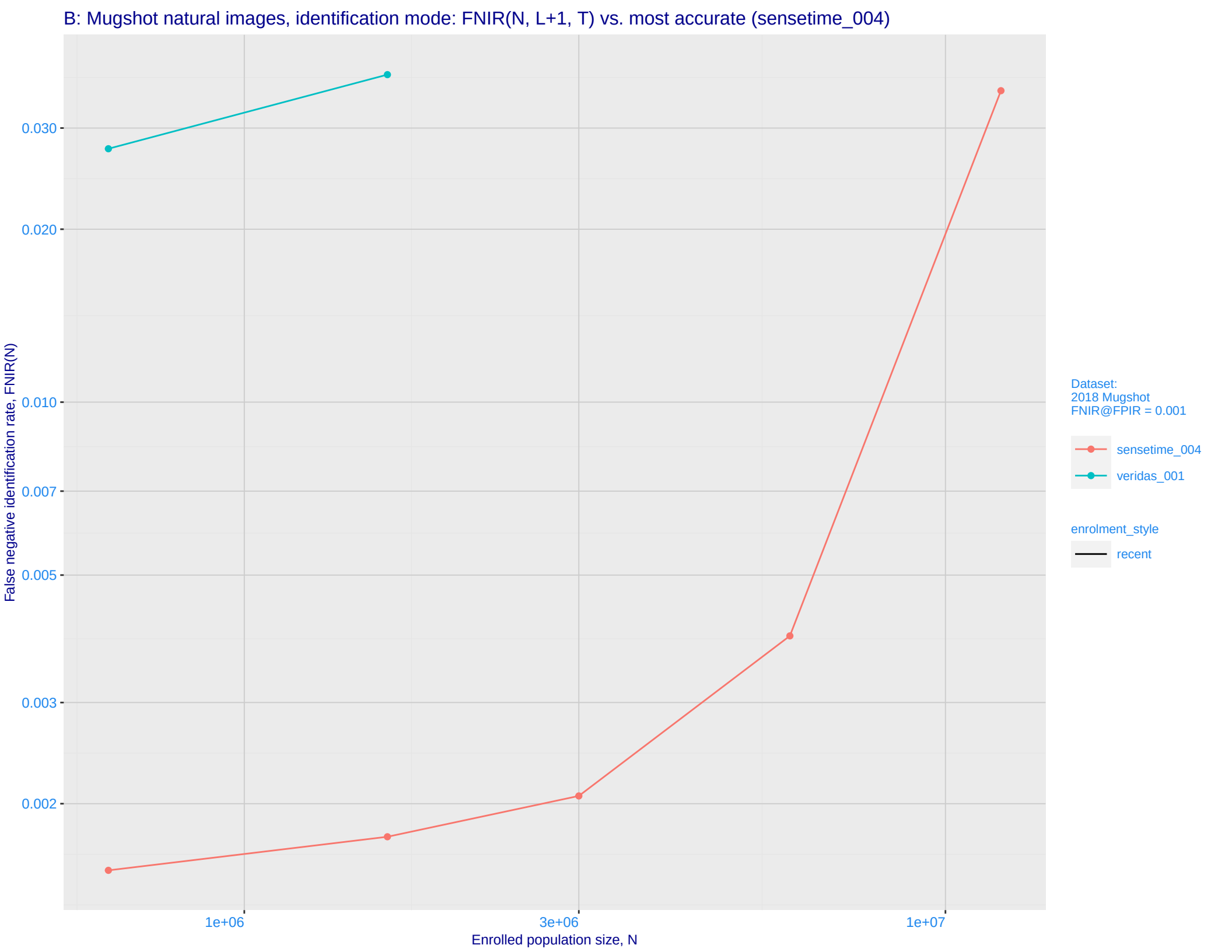
Frontal mugshot ranking 62 (out of 268) −− FNIR(1600000, T, L+1) = 0.0372, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

Mugshot webcam ranking 48 (out of 228) −− FNIR(1600000, T, L+1) = 0.0823, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

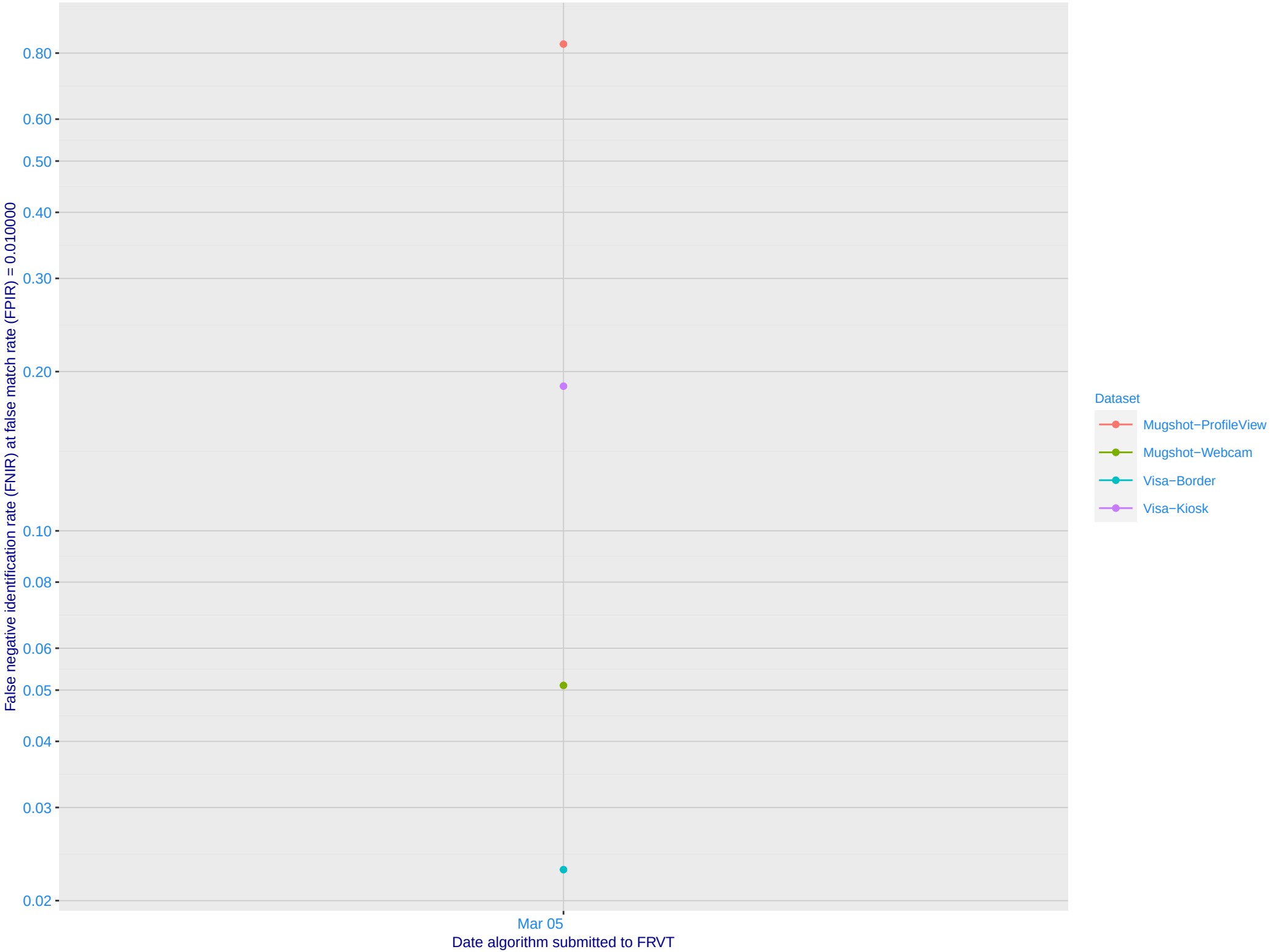
Mugshot profile ranking 73 (out of 198) −− FNIR(1600000, T, L+1) = 0.9874, FPIR=0.001000 vs. lowest 0.1331 from hr_000

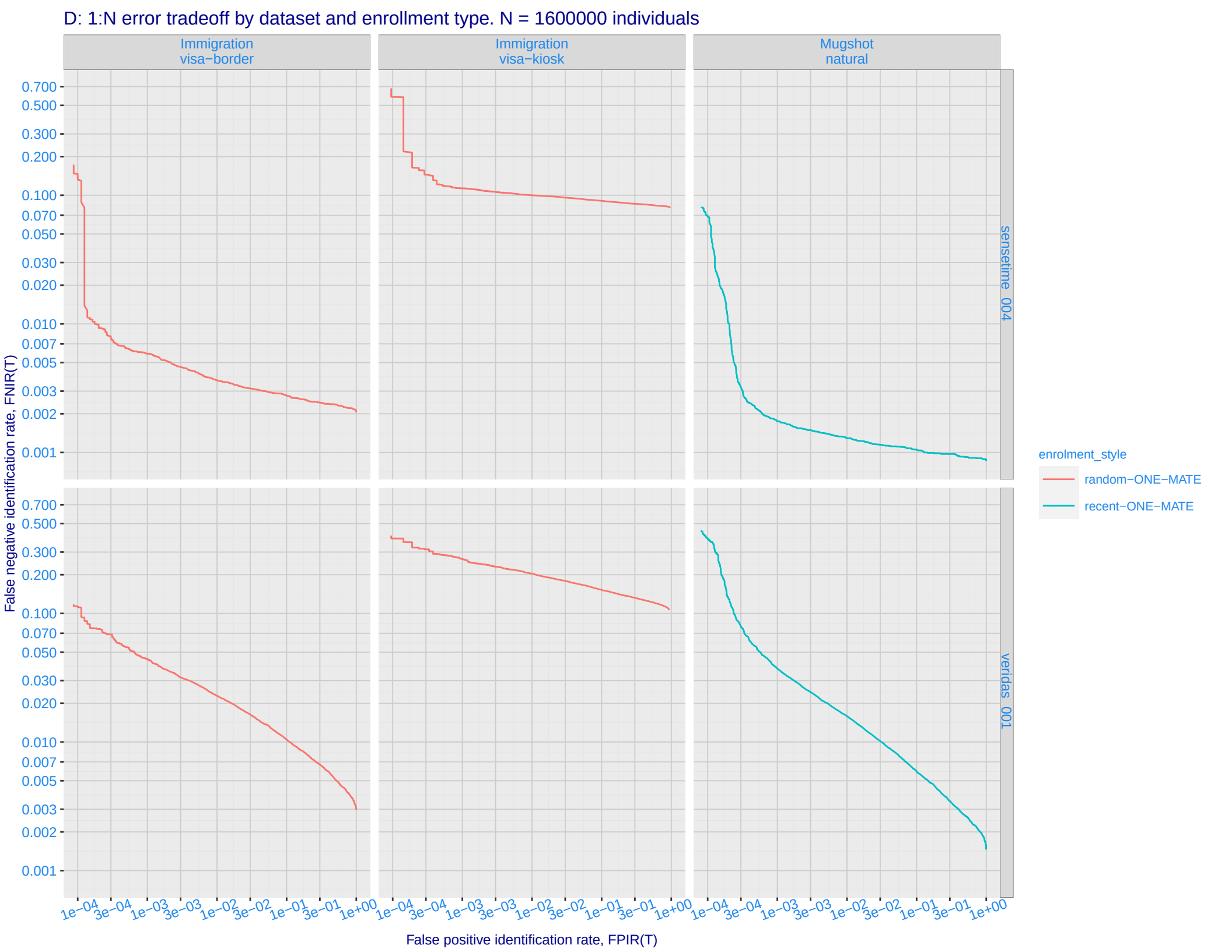
Immigration visa−border ranking 39 (out of 156) −− FNIR(1600000, T, L+1) = 0.0441, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

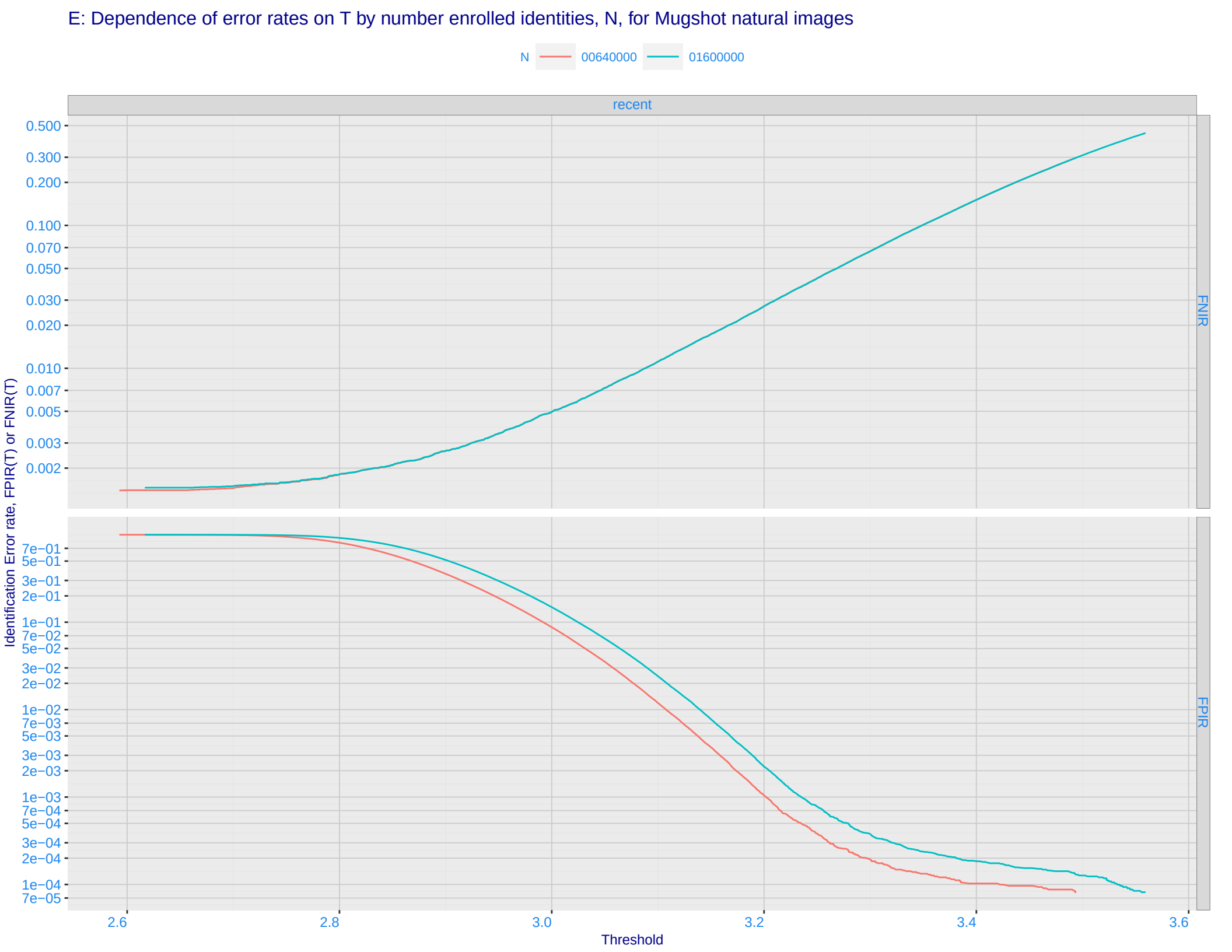
Immigration visa−kiosk ranking 34 (out of 151) −− FNIR(1600000, T, L+1) = 0.2657, FPIR=0.001000 vs. lowest 0.0996 from hr_000

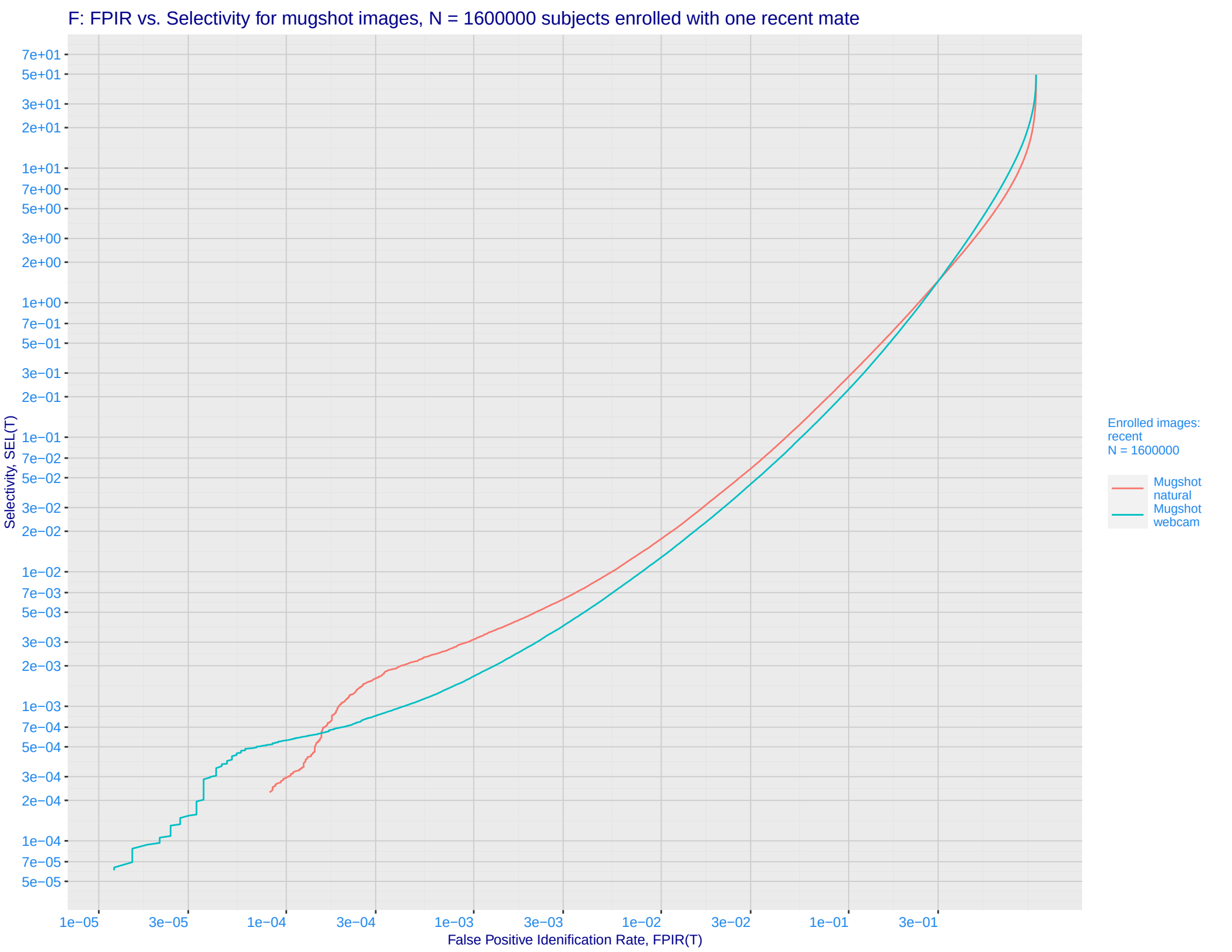

B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)
False negative identification rate, FNIR(N)
0.030
0.020
0.010
0.007
0.005
0.003
0.002
1e+06
3e+06
1e+07
Enrolled population size, N
Dataset:
2018 Mugshot
FNIR@FPIR = 0.001
sensetime_004
veridas_001
enrolment_style
recent

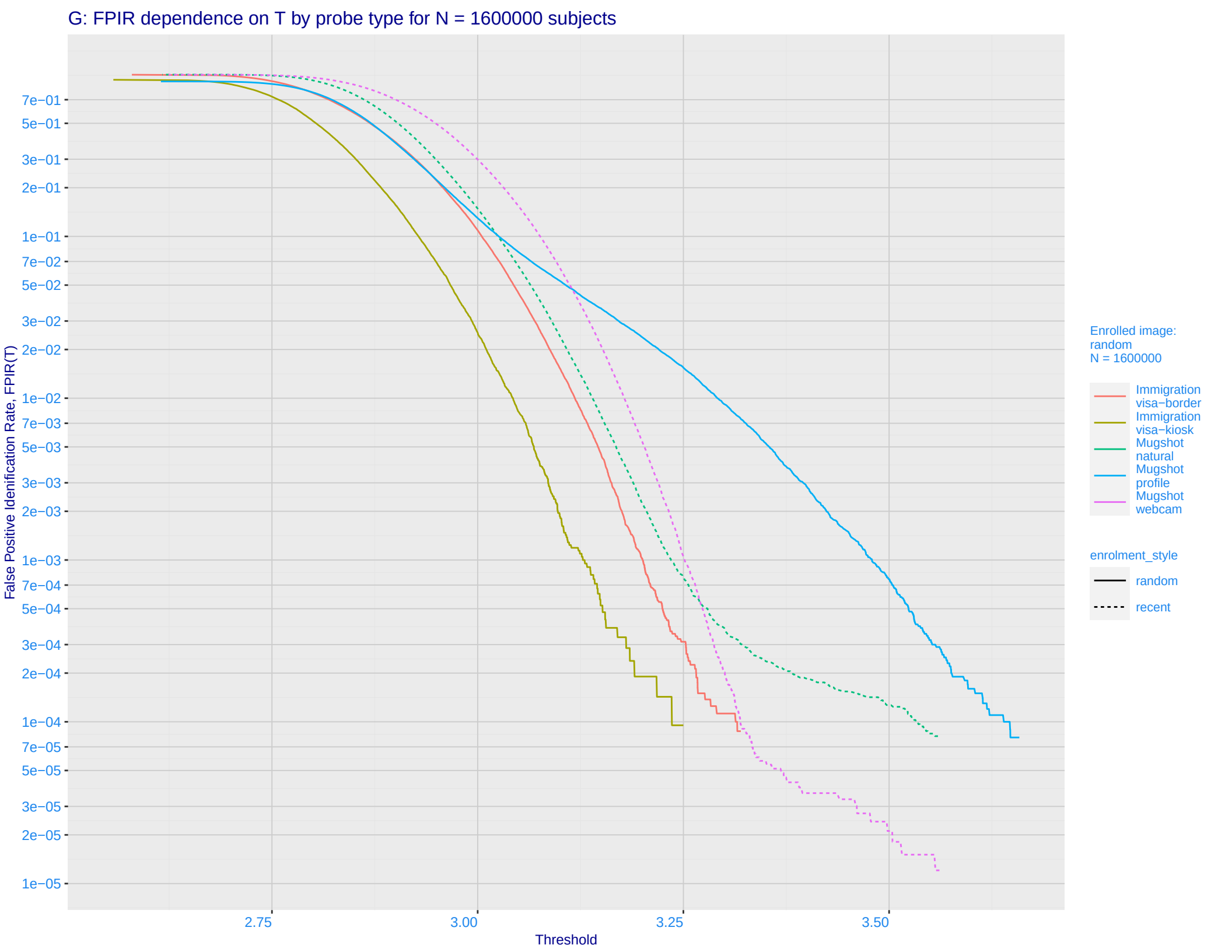
C: Evolution of accuracy for VERIDAS algorithms on three datasets 2018 − present

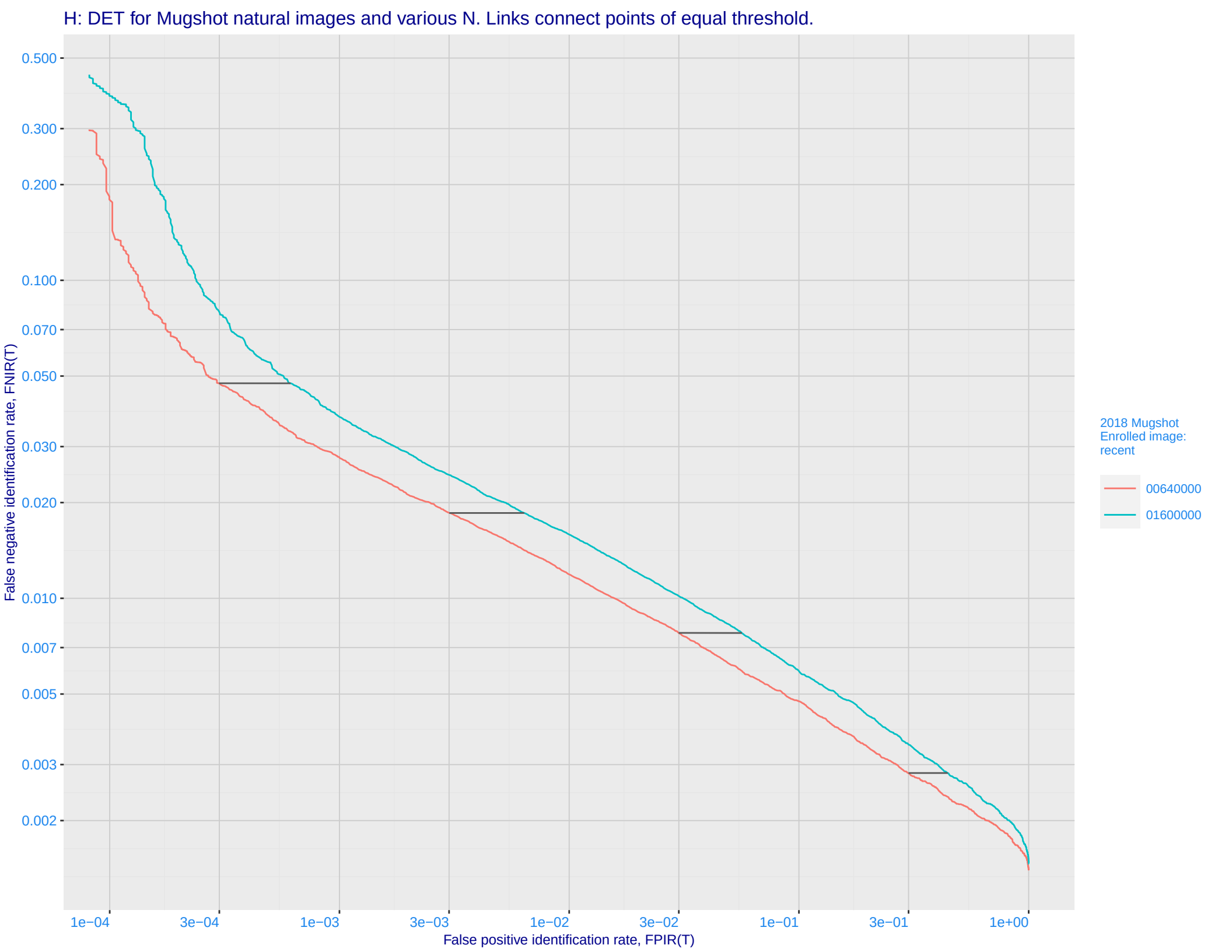


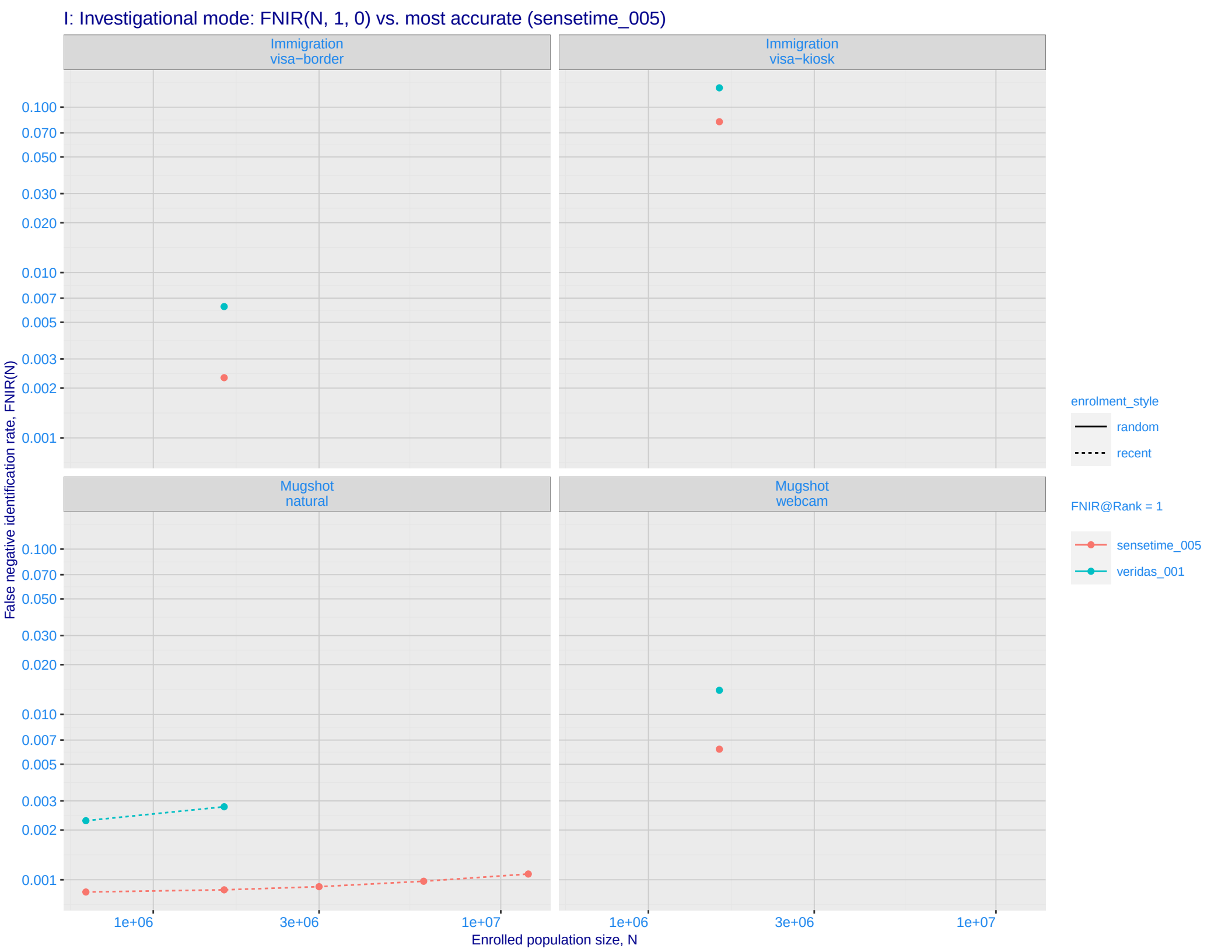

D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
sensetime_004
veridas_001
False negative identification rate, FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
enrolment_style
random−ONE−MATE
recent−ONE−MATE

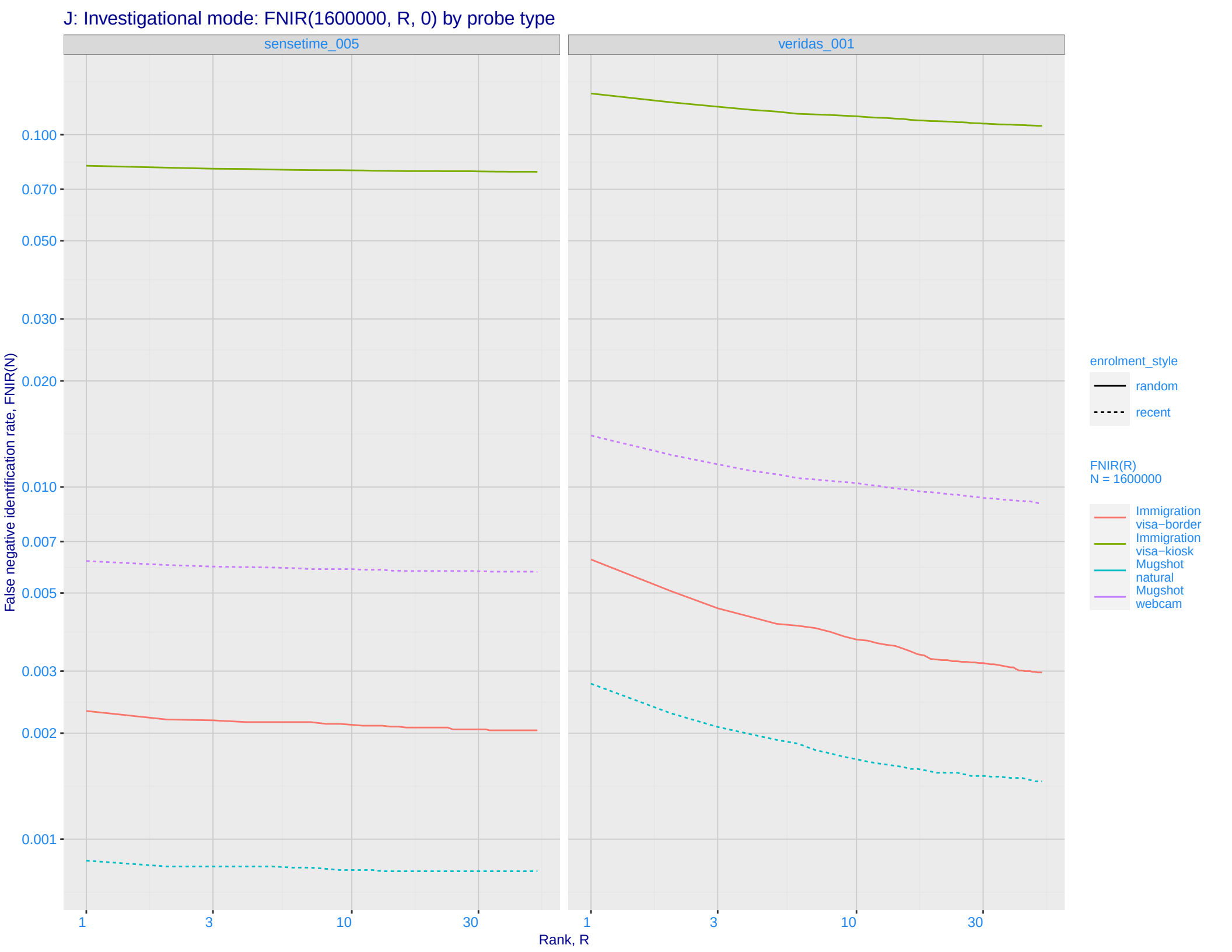

E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images
N
00640000
01600000
recent
FNIR
FPIR
Identification Error rate, FPIR(T) or FNIR(T)
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
7e−01
5e−01
3e−01
2e−01
1e−01
7e−02
5e−02
3e−02
2e−02
1e−02
7e−03
5e−03
3e−03
2e−03
1e−03
7e−04
5e−04
3e−04
2e−04
1e−04
7e−05
2.6
2.8
3.0
3.2
3.4
3.6
Threshold


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate
Selectivity, SEL(T)
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
7e−03
5e−03
3e−03
2e−03
1e−03
7e−04
5e−04
3e−04
2e−04
1e−04
7e−05
5e−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)
Enrolled images:
recent
N = 1600000
Mugshot
natural
Mugshot
webcam

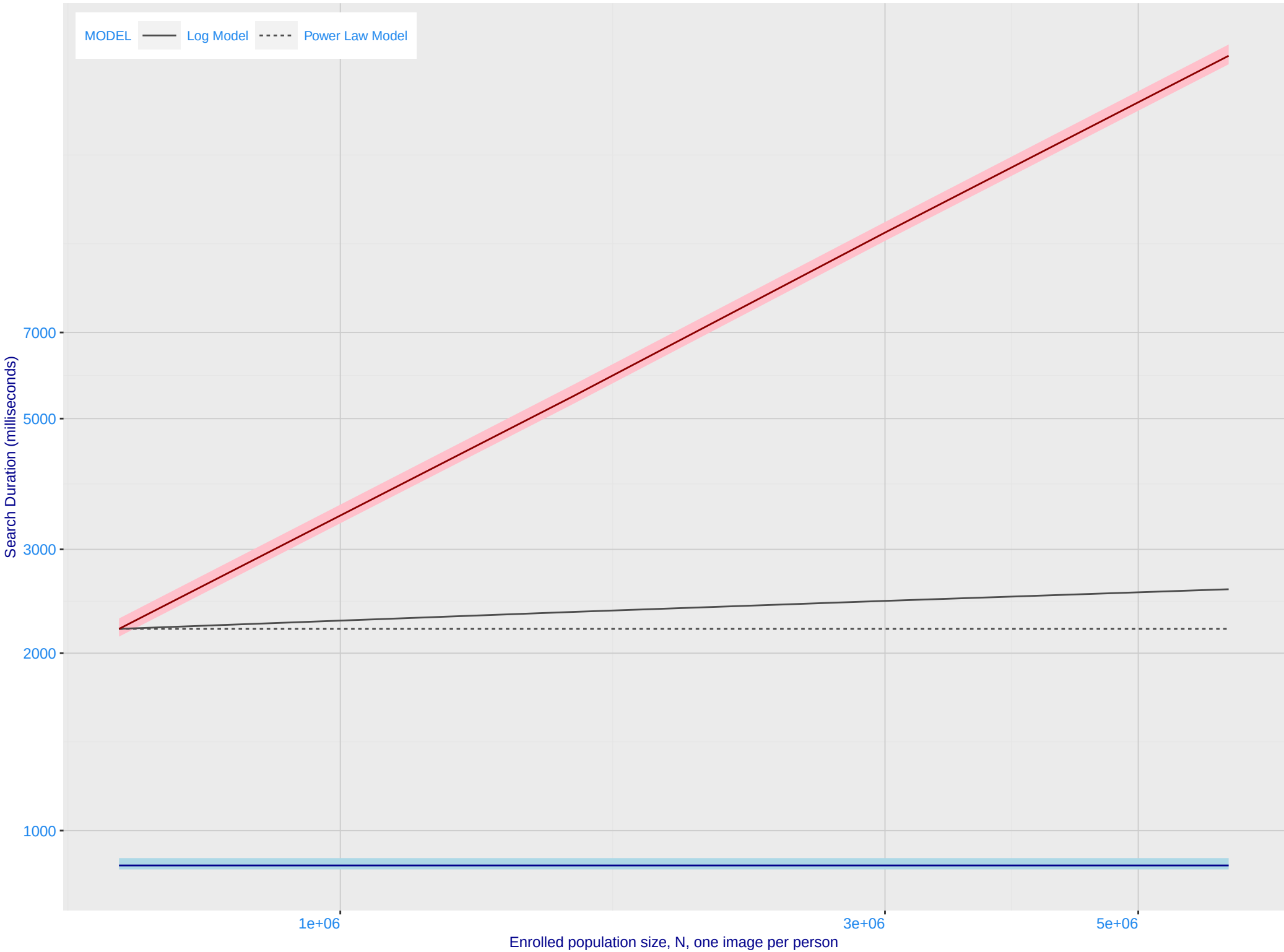

G: FPIR dependence on T by probe type for N = 1600000 subjects
False Positive Idenification Rate, FPIR(T)
7e−01
5e−01
3e−01
2e−01
1e−01
7e−02
5e−02
3e−02
2e−02
1e−02
7e−03
5e−03
3e−03
2e−03
1e−03
7e−04
5e−04
3e−04
2e−04
1e−04
7e−05
5e−05
3e−05
2e−05
1e−05
2.75
3.00
3.25
3.50
Threshold
Enrolled image:
random
N = 1600000
Immigration
visa−border
Immigration
visa−kiosk
Mugshot
natural
Mugshot
profile
Mugshot
webcam
enrolment_style
random
recent

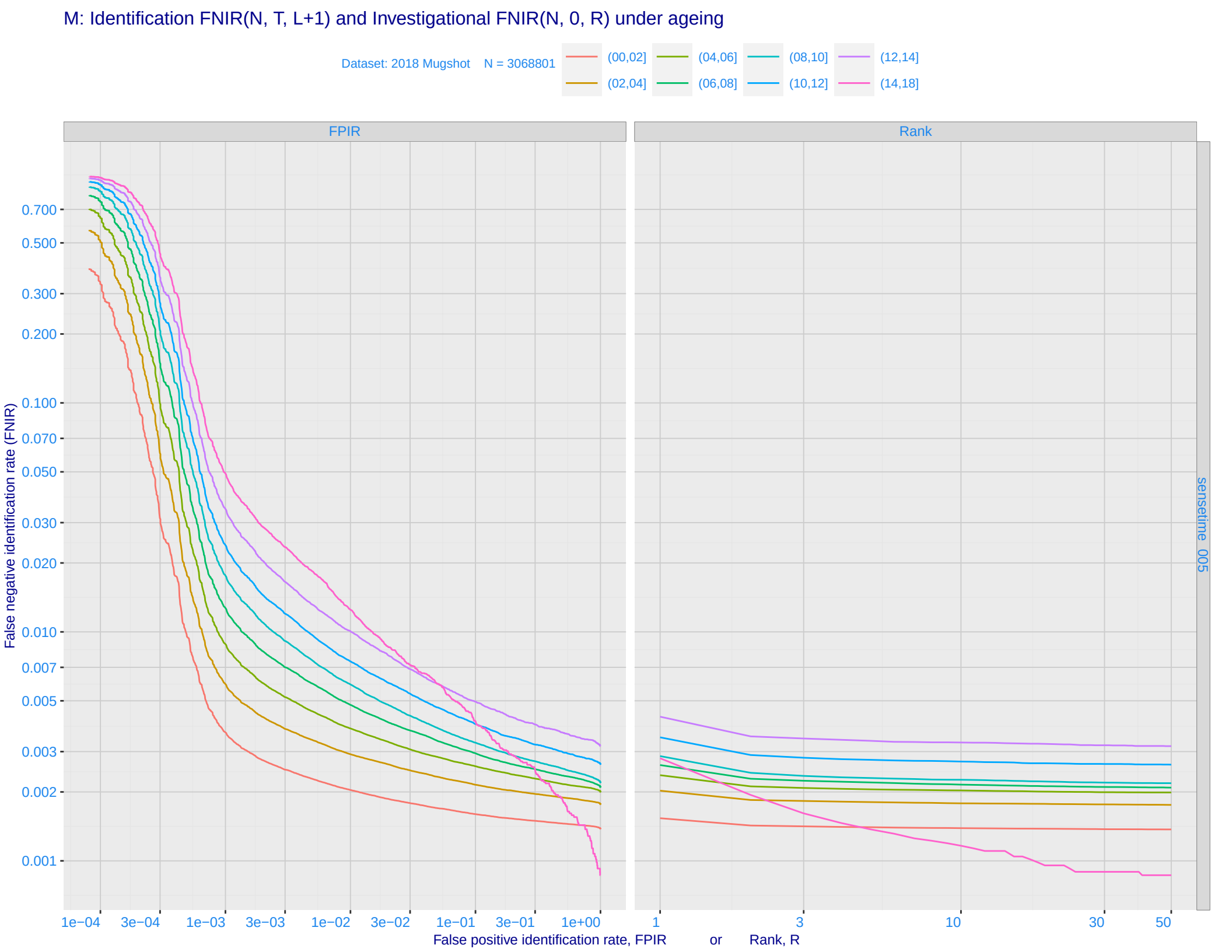

H: DET for Mugshot natural images and various N. Links connect points of equal threshold.
False negative identification rate, FNIR(T)
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
2018 Mugshot
Enrolled image:
recent
00640000
01600000


I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005)
Immigration
visa−border
Immigration
visa−kiosk
Mugshot
natural
Mugshot
webcam
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
False negative identification rate, FNIR(N)
1e+06
3e+06
1e+07
Enrolled population size, N
enrolment_style
random
recent
FNIR@Rank = 1
sensetime_005
veridas_001


J: Investigational mode: FNIR(1600000, R, 0) by probe type
sensetime_005
veridas_001
False negative identification rate, FNIR(N)
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
1
3
10
30
Rank, R
enrolment_style
random
recent
FNIR(R)
N = 1600000
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
Mugshot webcam

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




M: Identification FNIR(N, T, L+1) and Investigational FNIR(N, 0, R) under ageing
Dataset: 2018 Mugshot N = 3068801
(00,02]
(02,04]
(04,06]
(06,08]
(08,10]
(10,12]
(12,14]
(14,18]
FPIR
Rank
False negative identification rate (FNIR)
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
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
1
3
10
30
50
False positive identification rate, FPIR or Rank, R
sensetime 005