A: Datasheet

Algorithm: everai_0

Developer: Paravision (EverAI)

Submission Date: 2018_06_21

Template size: 2048 bytes

Template time (2.5 percentile): 430 msec

Template time (median): 431 msec

Template time (97.5 percentile): 459 msec

Investigation:

Frontal mugshot ranking 161 (out of 265) −− FNIR(1600000, 0, 1) = 0.0188 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 127 (out of 227) −− FNIR(1600000, 0, 1) = 0.0379 vs. lowest 0.0062 from sensetime_005

Mugshot profile ranking 53 (out of 196) −− FNIR(1600000, 0, 1) = 0.5341 vs. lowest 0.0591 from sensetime_005

Immigration visa−border ranking 128 (out of 148) −− FNIR(1600000, 0, 1) = 0.4229 vs. lowest 0.0013 from visionlabs_010

Immigration visa−kiosk ranking 124 (out of 145) −− FNIR(1600000, 0, 1) = 0.5291 vs. lowest 0.0568 from hr_000

Identification:

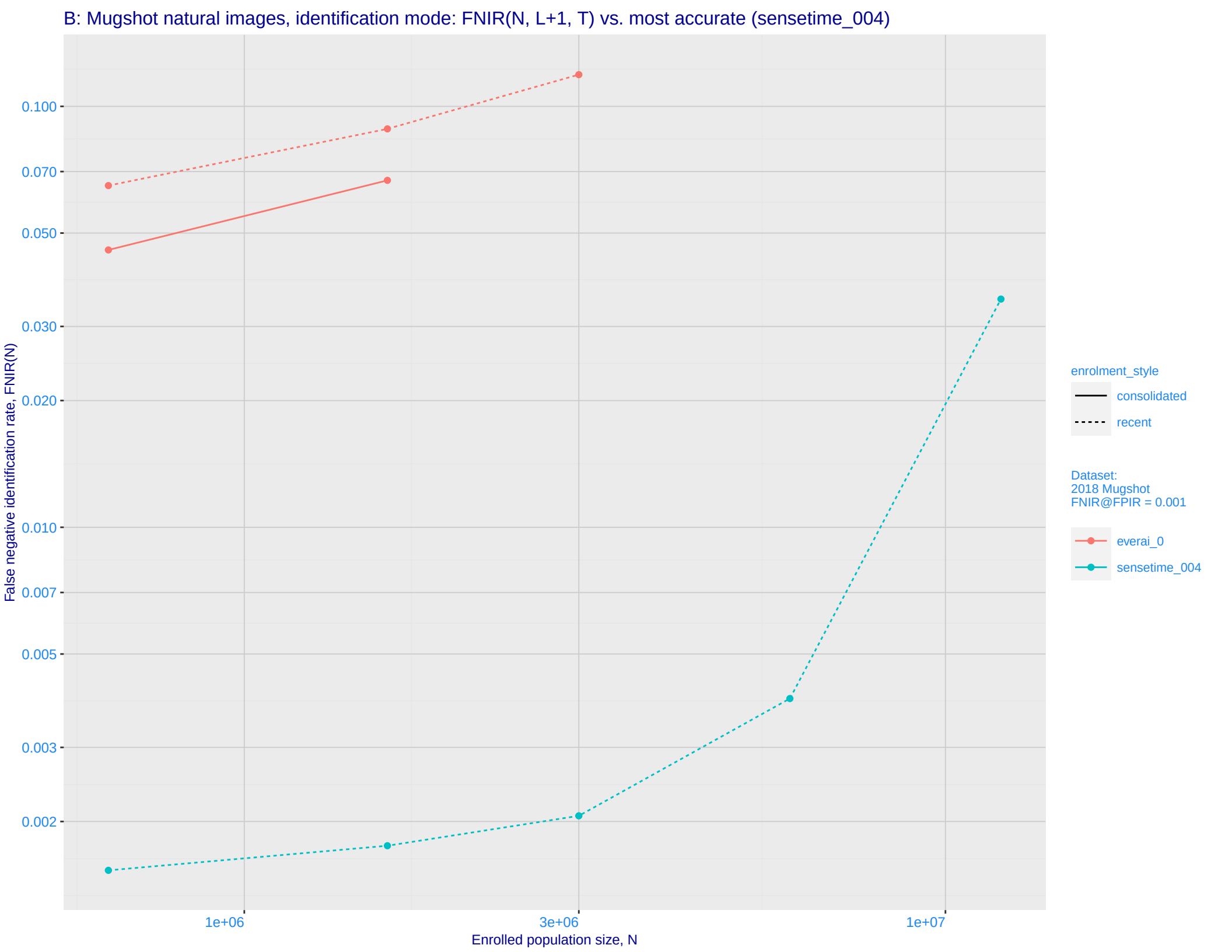
Frontal mugshot ranking 128 (out of 265) −− FNIR(1600000, T, L+1) = 0.0884, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

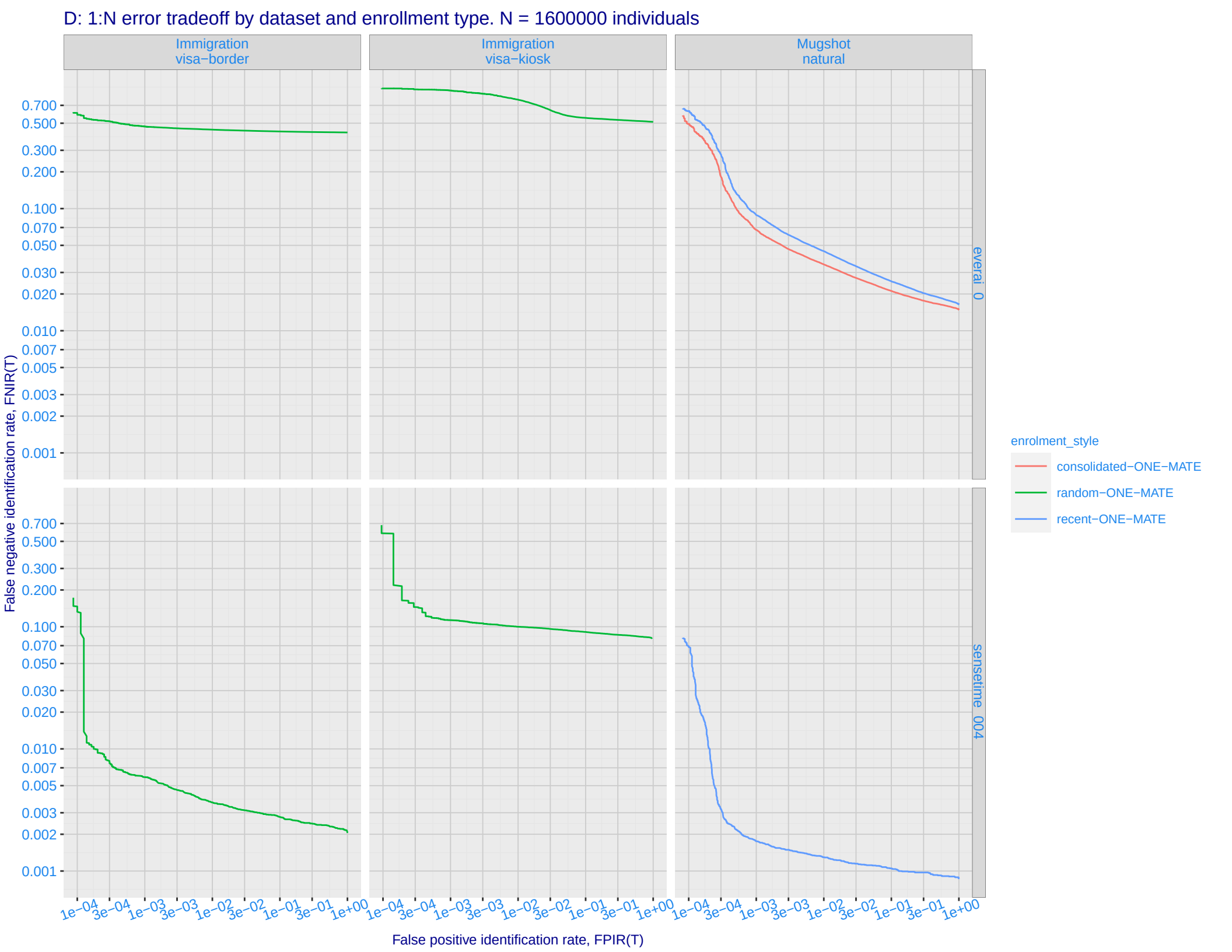
Mugshot webcam ranking 120 (out of 225) −− FNIR(1600000, T, L+1) = 0.1696, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

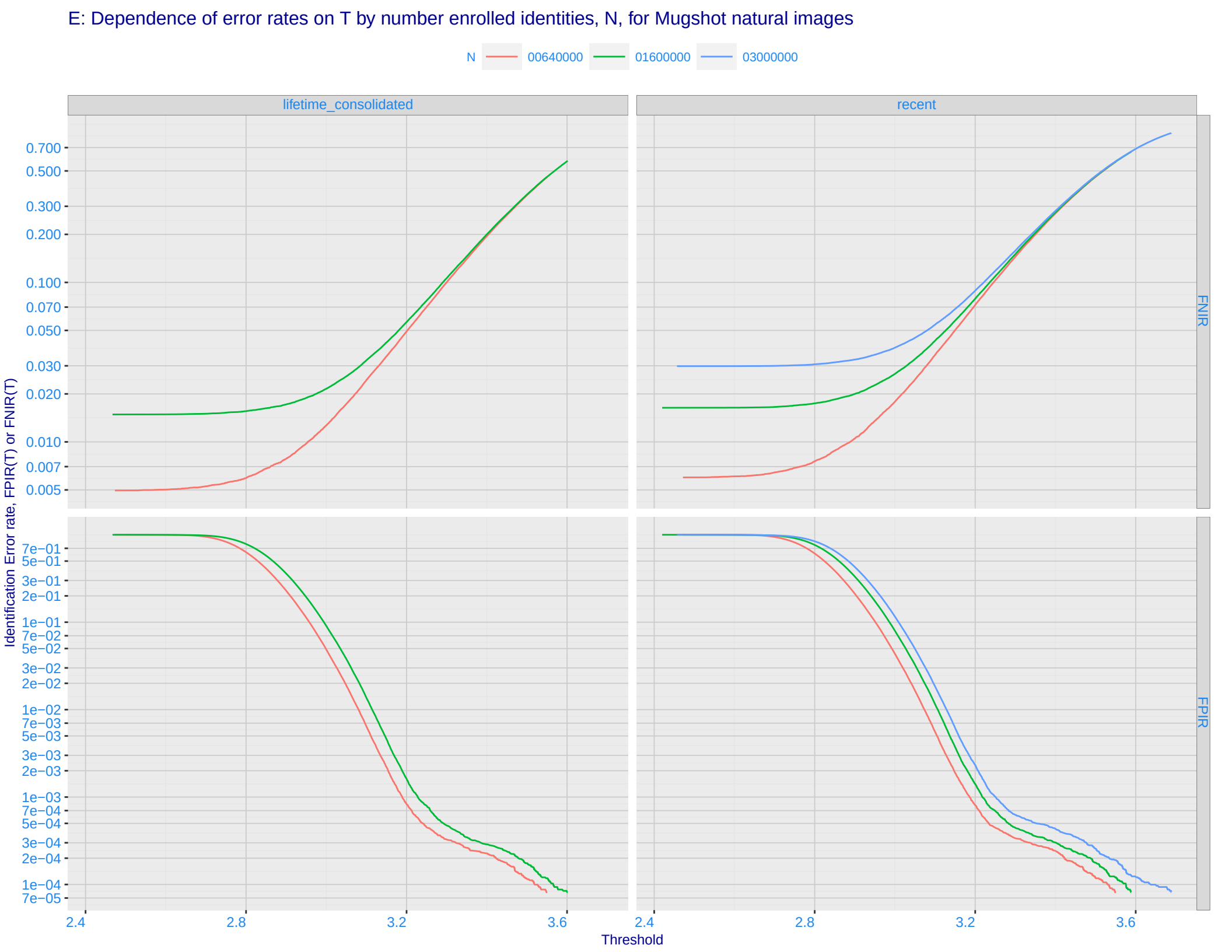
Mugshot profile ranking 136 (out of 195) −− FNIR(1600000, T, L+1) = 0.9992, FPIR=0.001000 vs. lowest 0.1331 from hr_000

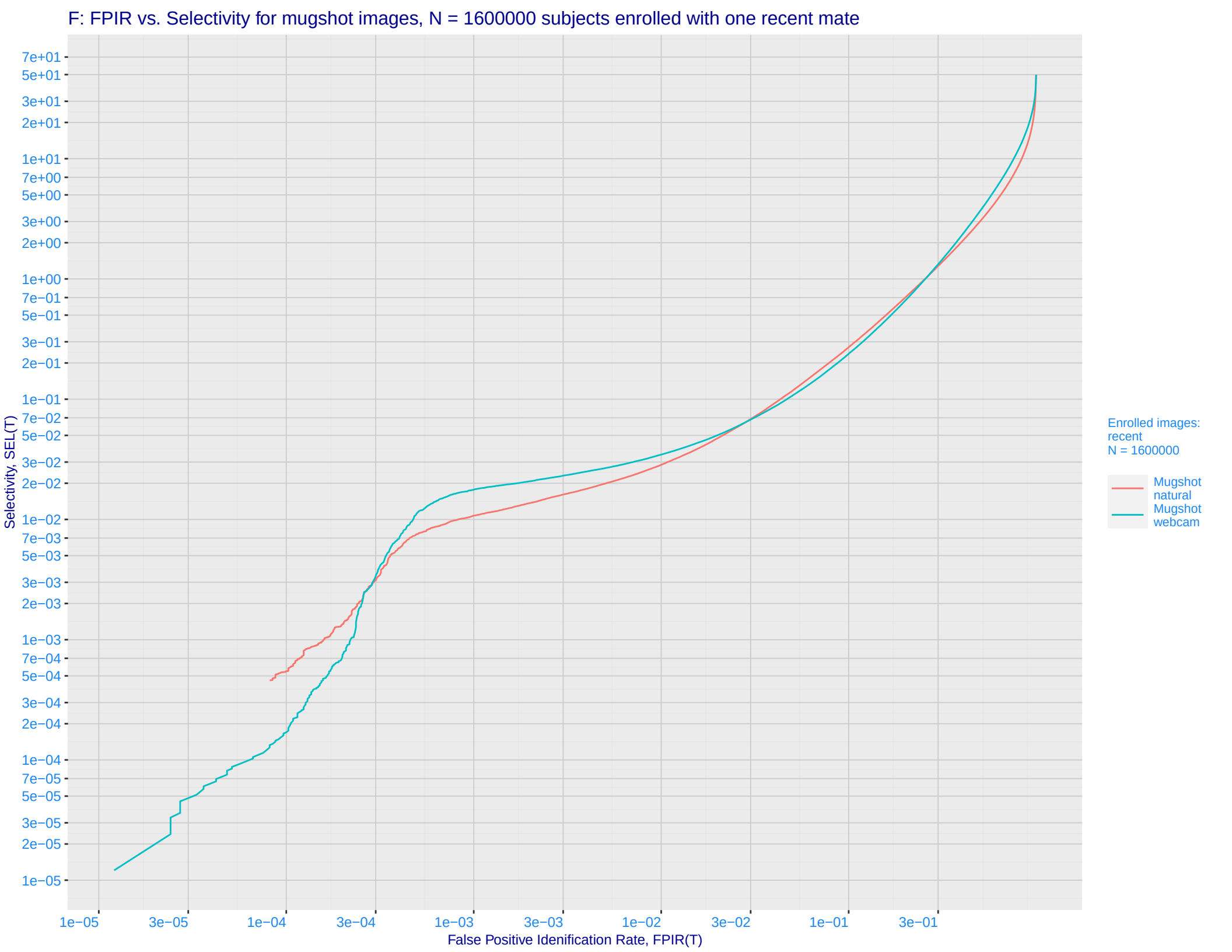
Immigration visa−border ranking 104 (out of 146) −− FNIR(1600000, T, L+1) = 0.4699, FPIR=0.001000 vs. lowest 0.0049 from hr_000

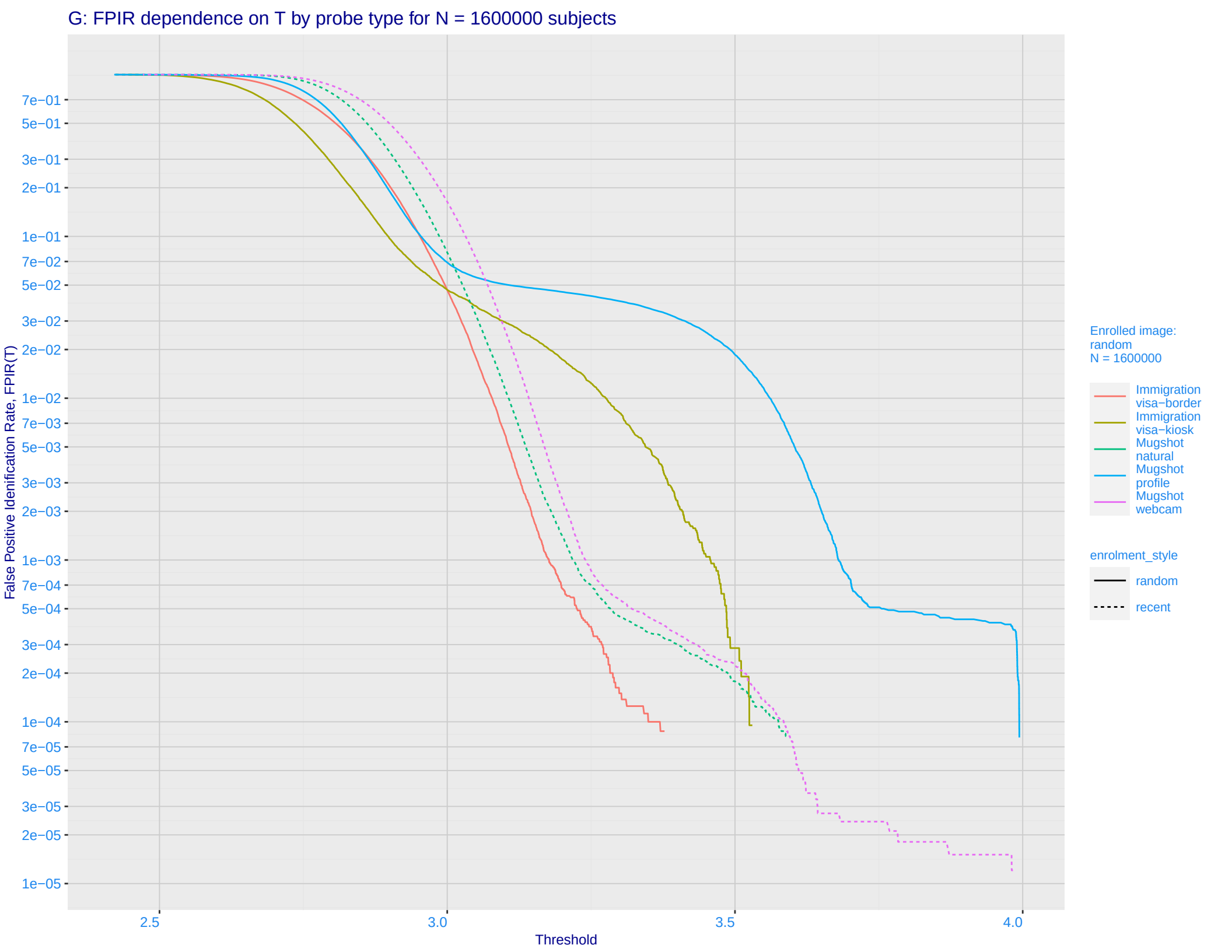
Immigration visa−kiosk ranking 108 (out of 141) −− FNIR(1600000, T, L+1) = 0.9265, FPIR=0.001000 vs. lowest 0.0996 from hr_000

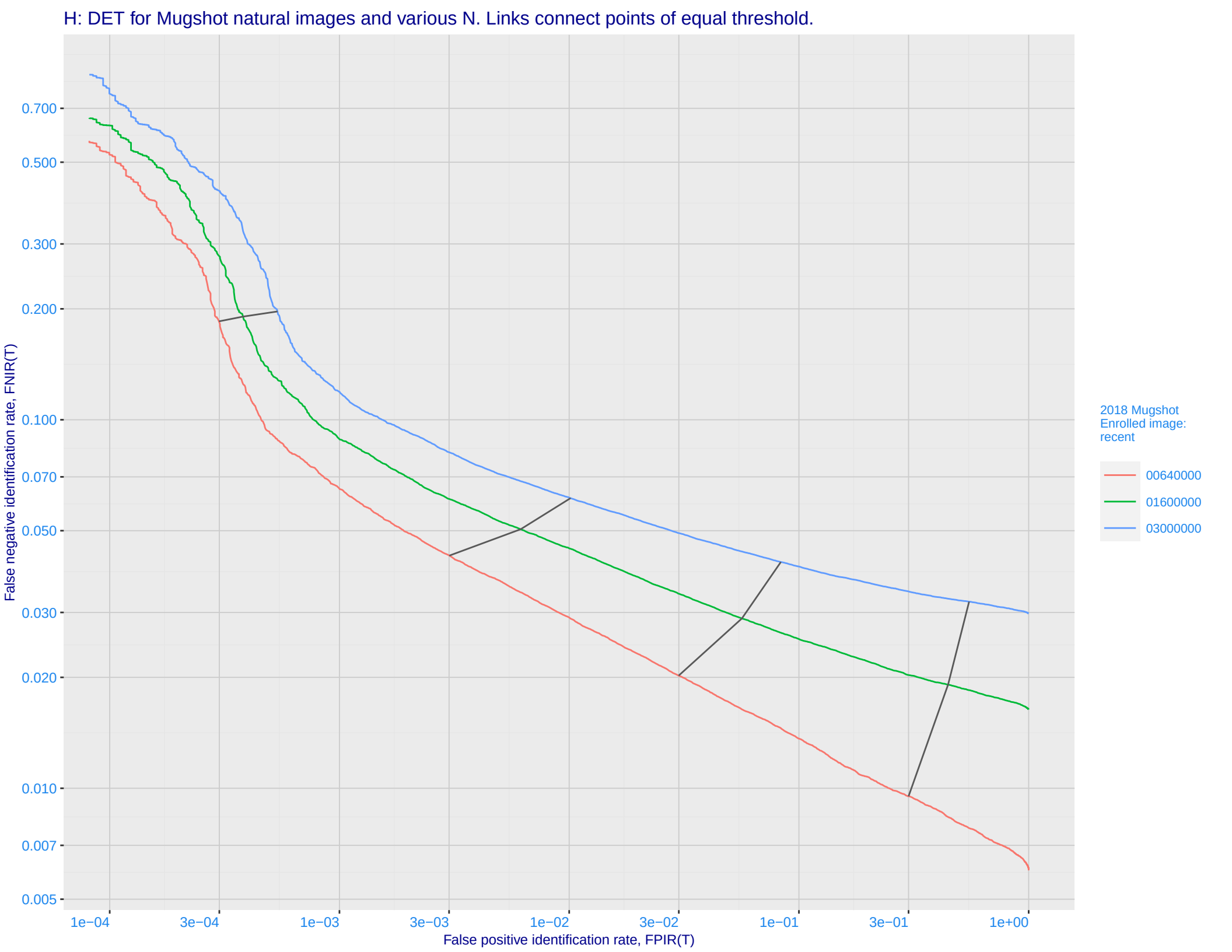

B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)
False negative identification rate, FNIR(N)
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
1e+06
3e+06
1e+07
Enrolled population size, N
enrolment_style
consolidated
recent
Dataset:
2018 Mugshot
FNIR@FPIR = 0.001
everai_0
sensetime_004

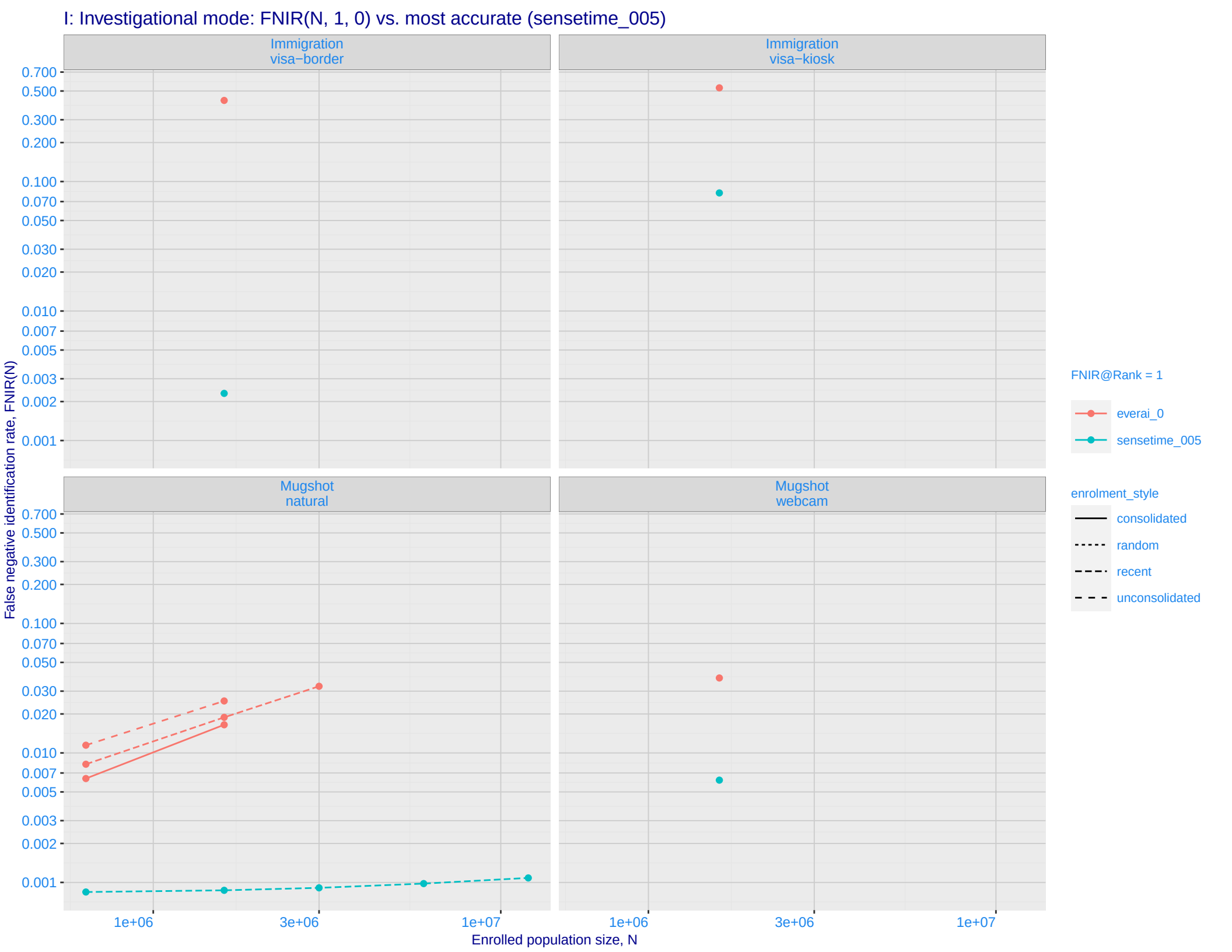

D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
everai 0
sensetime 004
False negative identification rate, FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
enrolment_style
consolidated−ONE−MATE
random−ONE−MATE
recent−ONE−MATE

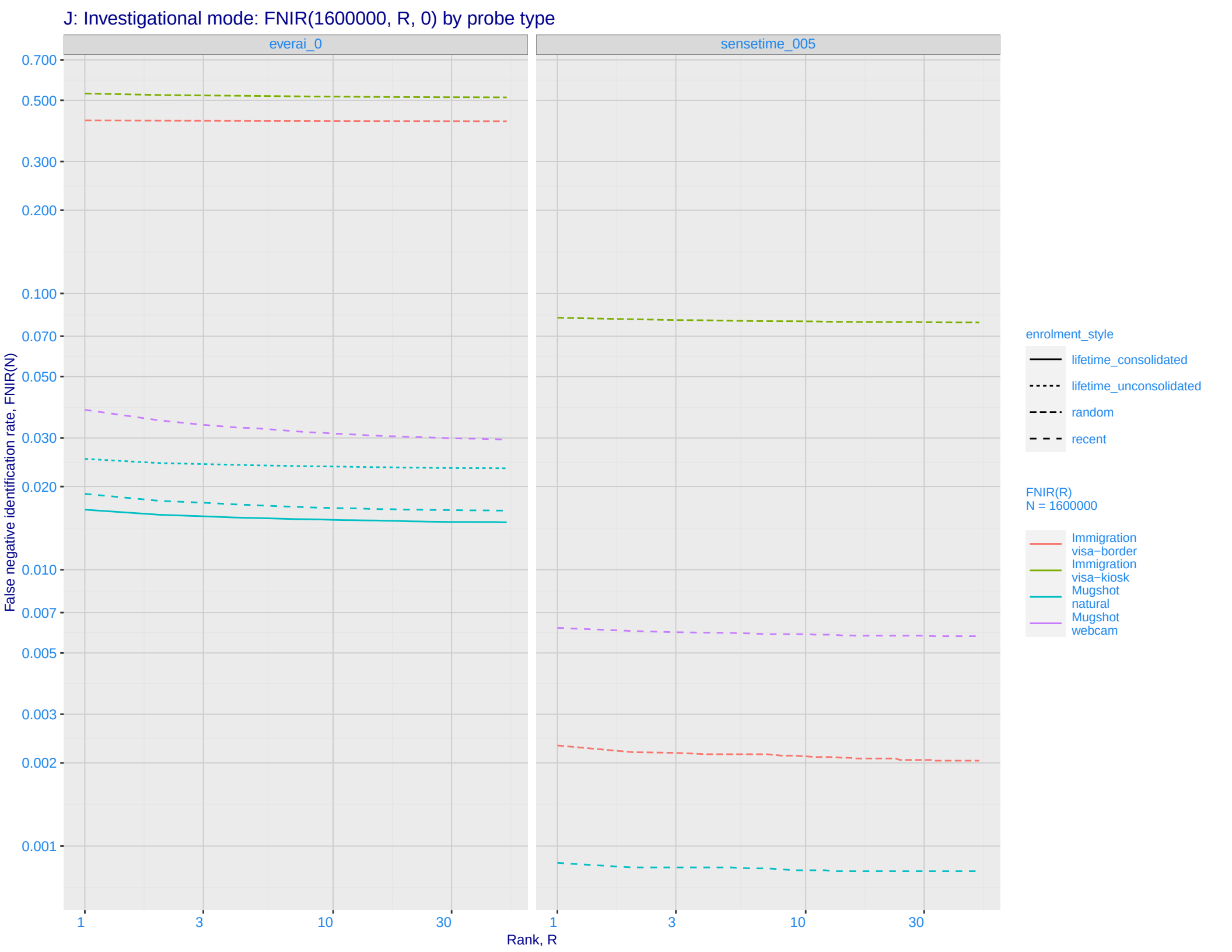

E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images
N
00640000
01600000
03000000
lifetime_consolidated
recent
FNIR
FPIR
Identification Error rate, FPIR(T) or FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
7e−01
5e−01
3e−01
2e−01
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
2.4
2.8
3.2
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
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)
Enrolled images:
recent
N = 1600000
Mugshot
natural
Mugshot
webcam

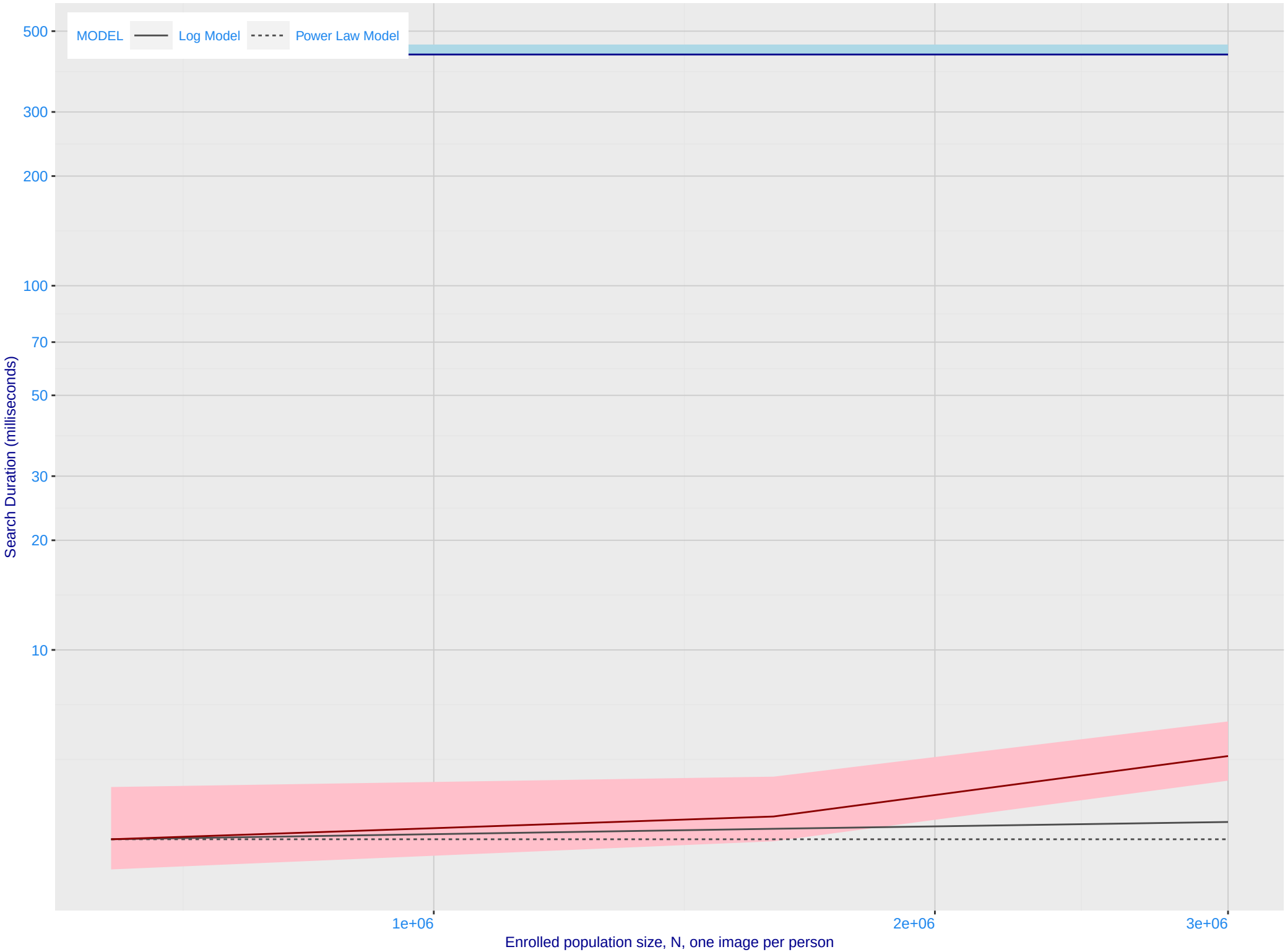

G: FPIR dependence on T by probe type for N = 1600000 subjects
False Positive Idenification Rate, FPIR(T)
7e−01
5e−01
3e−01
2e−01
1e−01
7e−02
5e−02
3e−02
2e−02
1e−02
7e−03
5e−03
3e−03
2e−03
1e−03
7e−04
5e−04
3e−04
2e−04
1e−04
7e−05
5e−05
3e−05
2e−05
1e−05
2.5
3.0
3.5
4.0
Threshold
Enrolled image:
random
N = 1600000
Immigration
visa−border
Immigration
visa−kiosk
Mugshot
natural
Mugshot
profile
Mugshot
webcam
enrolment_style
random
recent

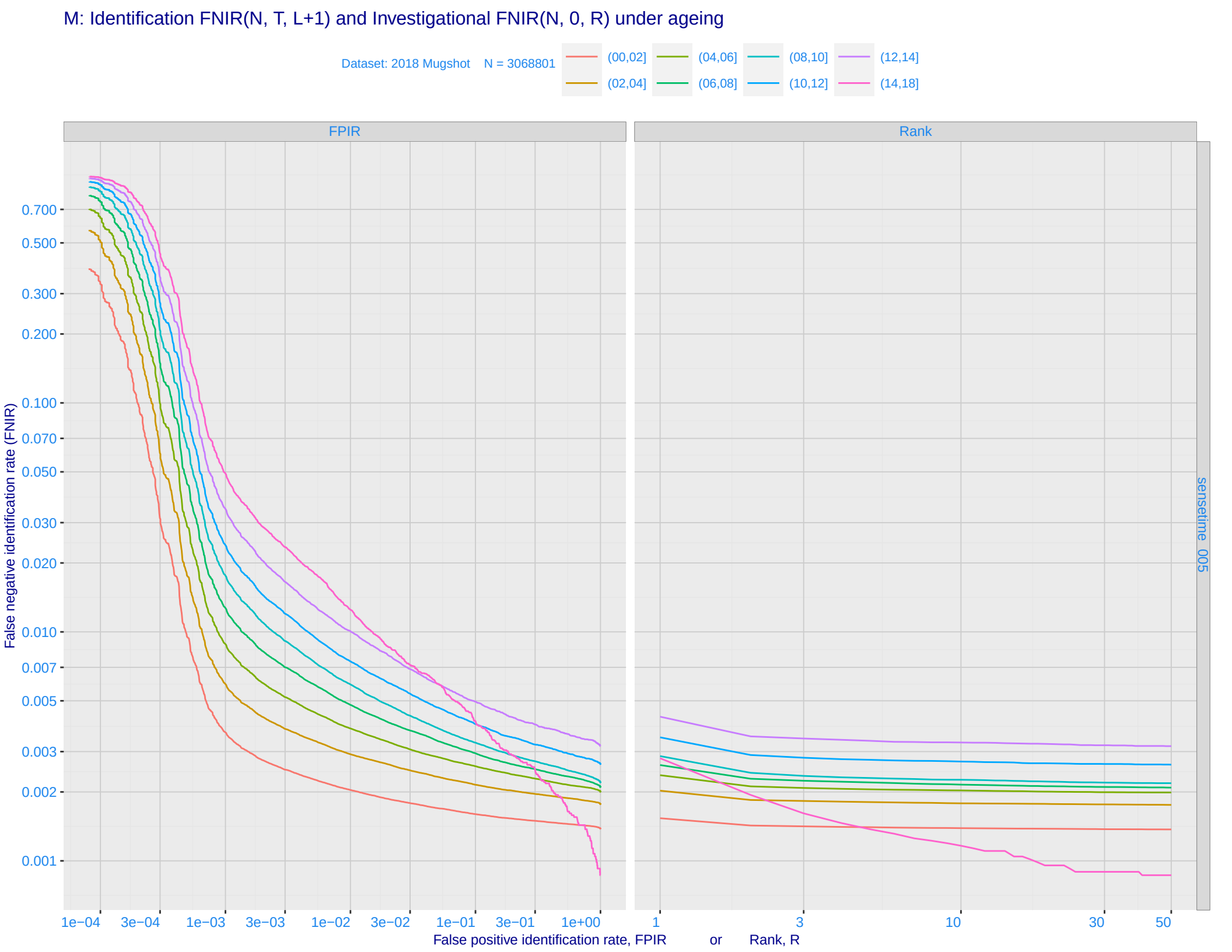

H: DET for Mugshot natural images and various N. Links connect points of equal threshold.
False negative identification rate, FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
2018 Mugshot Enrolled image: recent
00640000
01600000
03000000


I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005)
Immigration
visa−border
Immigration
visa−kiosk
Mugshot
natural
Mugshot
webcam
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
False negative identification rate, FNIR(N)
1e+06
3e+06
1e+07
Enrolled population size, N
FNIR@Rank = 1
everai_0
sensetime_005
enrolment_style
consolidated
random
recent
unconsolidated


J: Investigational mode: FNIR(1600000, R, 0) by probe type
everai_0
sensetime_005
False negative identification rate, FNIR(N)
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
1
3
10
30
Rank, R
enrolment_style
lifetime_consolidated
lifetime_unconsolidated
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