A: Datasheet

Algorithm: eyedea_1

Developer: Eyedea Recognition

Submission Date: 2018_02_16

Template size: 1036 bytes

Template time (2.5 percentile): 280 msec

Template time (median): 310 msec

Template time (97.5 percentile): 351 msec

Investigation:

Frontal mugshot ranking 231 (out of 259) −− FNIR(1600000, 0, 1) = 0.1960 vs. lowest 0.0009 from sensetime_005

Mugshot profile ranking 125 (out of 190) −− FNIR(1600000, 0, 1) = 0.9366 vs. lowest 0.0591 from sensetime_005

Immigration visa−border ranking 111 (out of 142) −− FNIR(1600000, 0, 1) = 0.2123 vs. lowest 0.0014 from visionlabs_009

Immigration visa−kiosk ranking 114 (out of 139) −− FNIR(1600000, 0, 1) = 0.4925 vs. lowest 0.0694 from cib_000

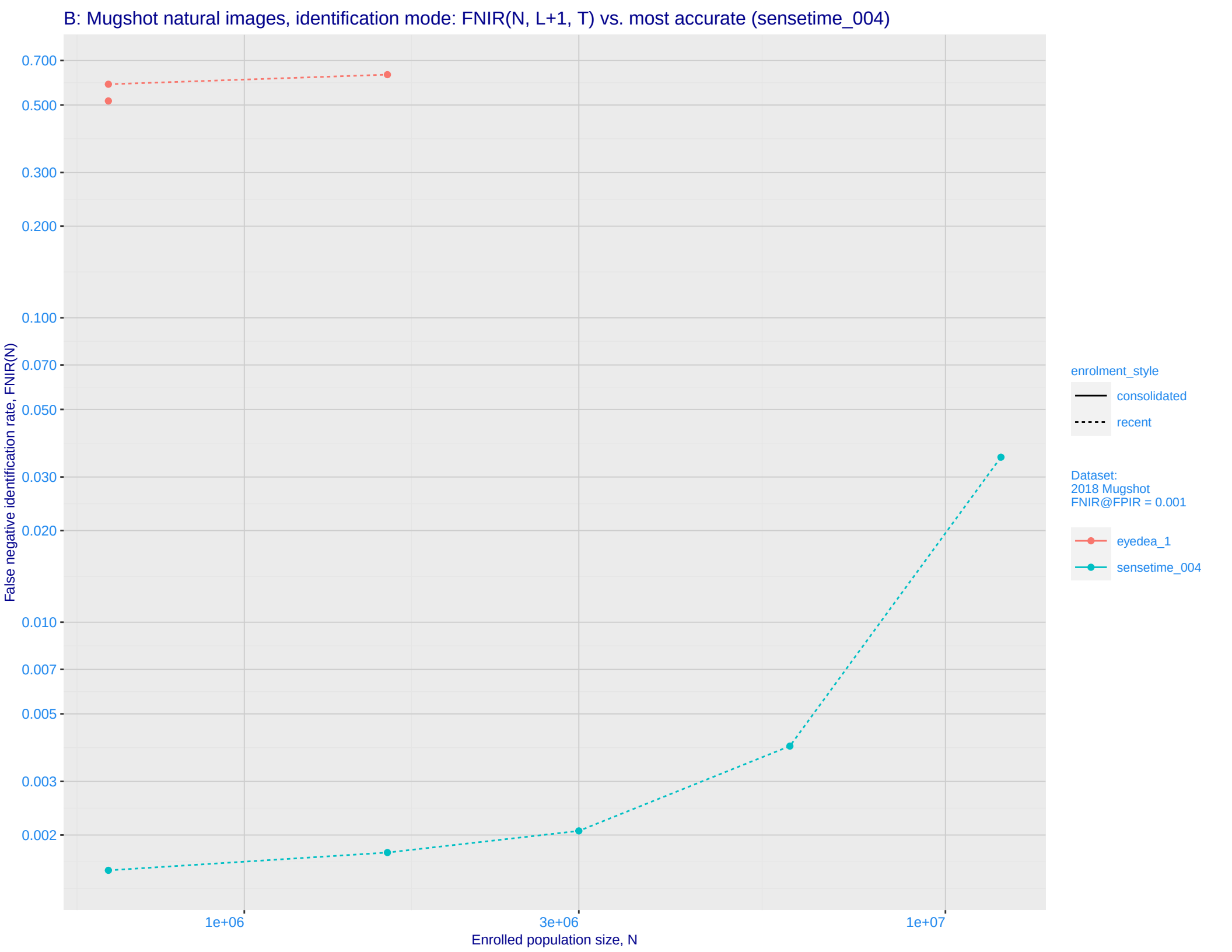
Identification:

Frontal mugshot ranking 225 (out of 259) −− FNIR(1600000, T, L+1) = 0.6291, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

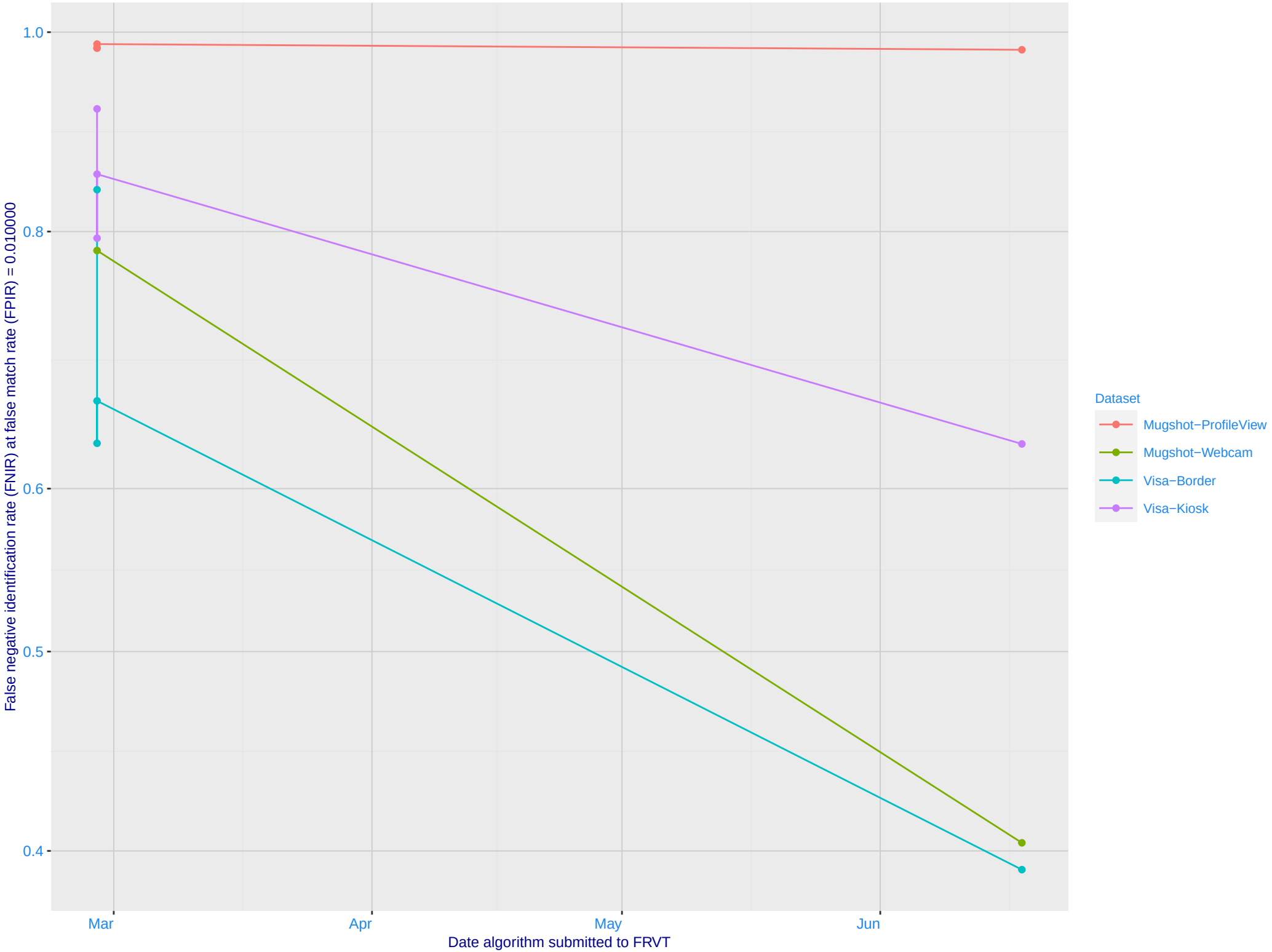
Mugshot profile ranking 126 (out of 189) −− FNIR(1600000, T, L+1) = 0.9990, FPIR=0.001000 vs. lowest 0.1733 from sensetime_005

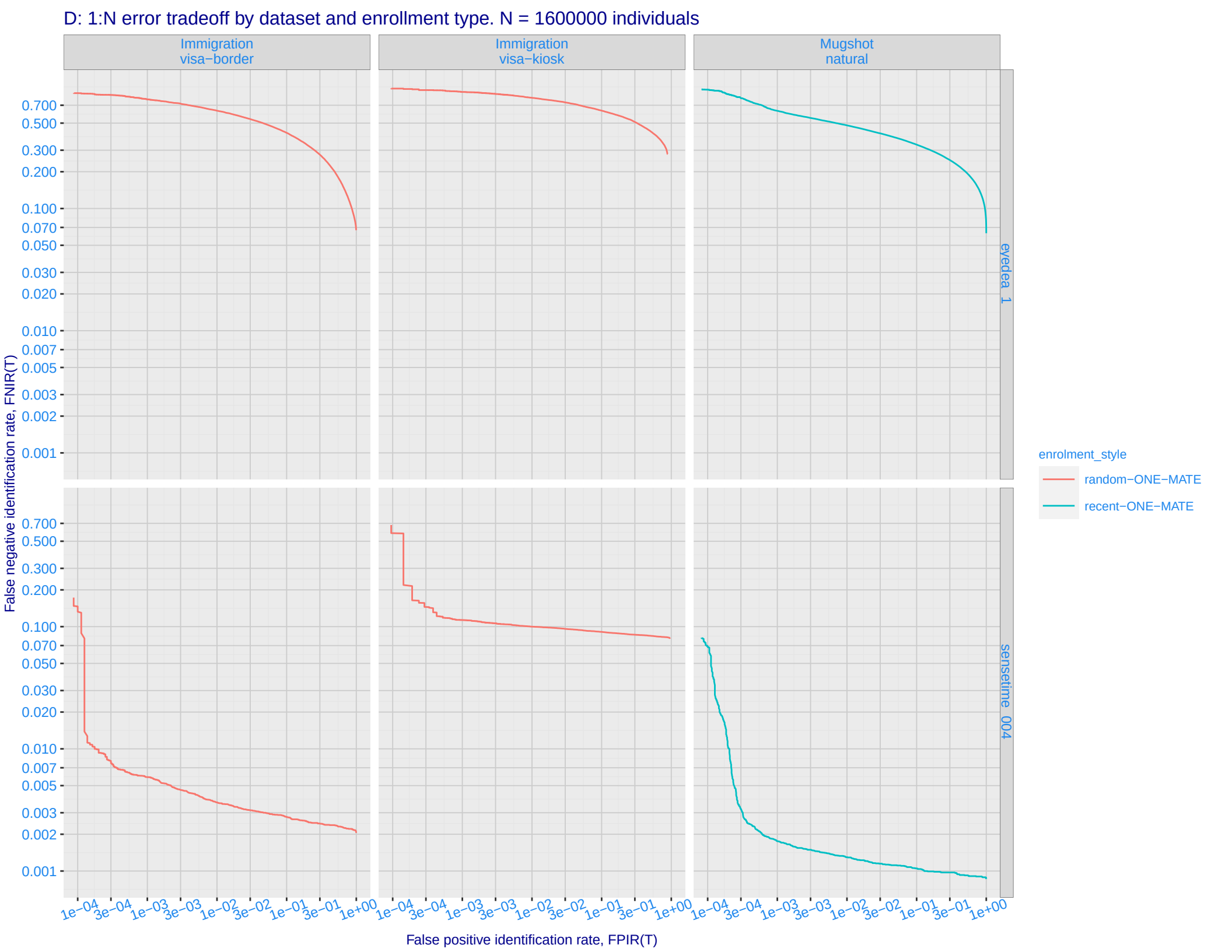
Immigration visa−border ranking 111 (out of 139) −− FNIR(1600000, T, L+1) = 0.7827, FPIR=0.001000 vs. lowest 0.0059 from sensetime_004

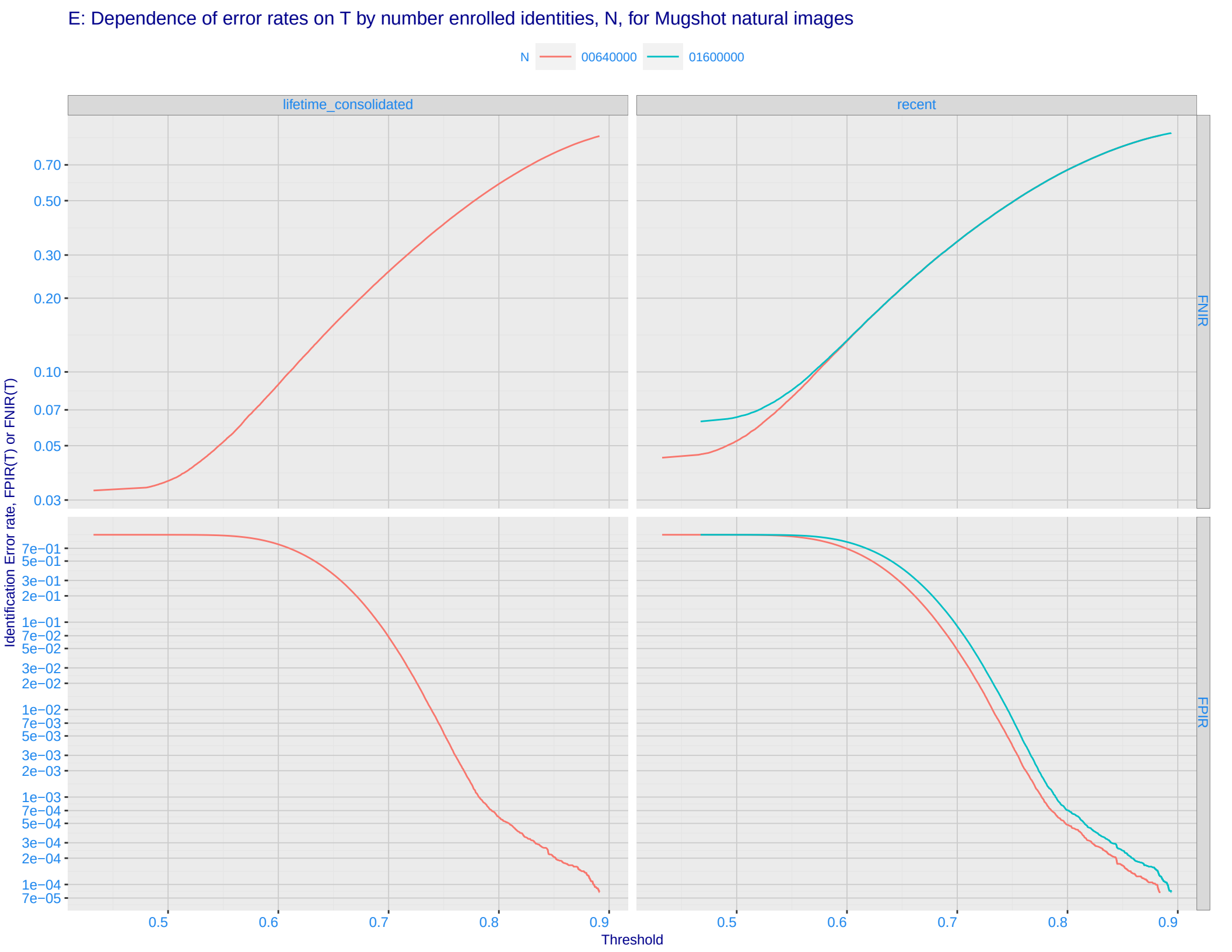
Immigration visa−kiosk ranking 96 (out of 134) −− FNIR(1600000, T, L+1) = 0.8991, FPIR=0.001000 vs. lowest 0.1048 from sensetime_005

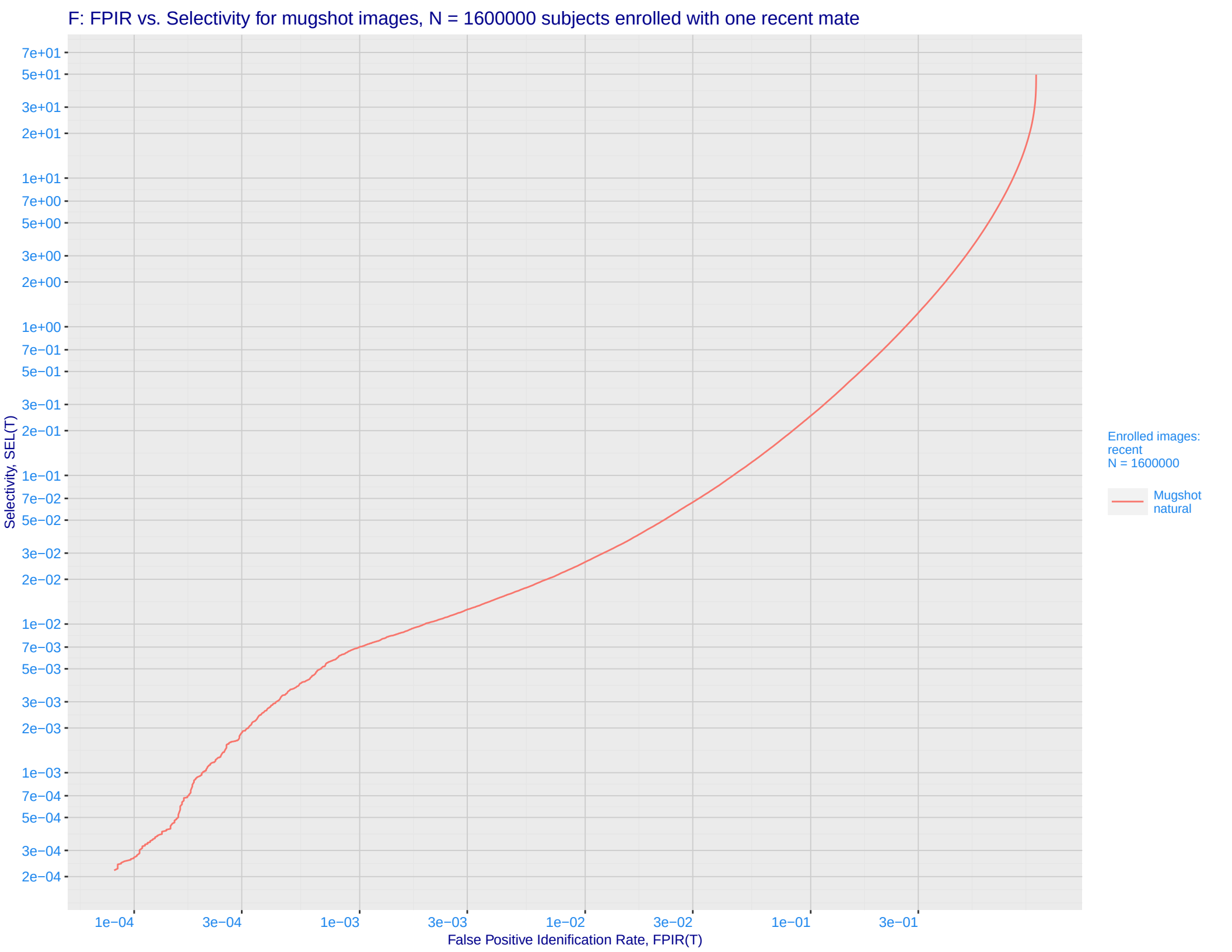

B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)
False negative identification rate, FNIR(N)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
1e+06
3e+06
1e+07
Enrolled population size, N
enrolment_style
consolidated
recent
Dataset:
2018 Mugshot
FNIR@FPIR = 0.001
eyedea_1
sensetime_004

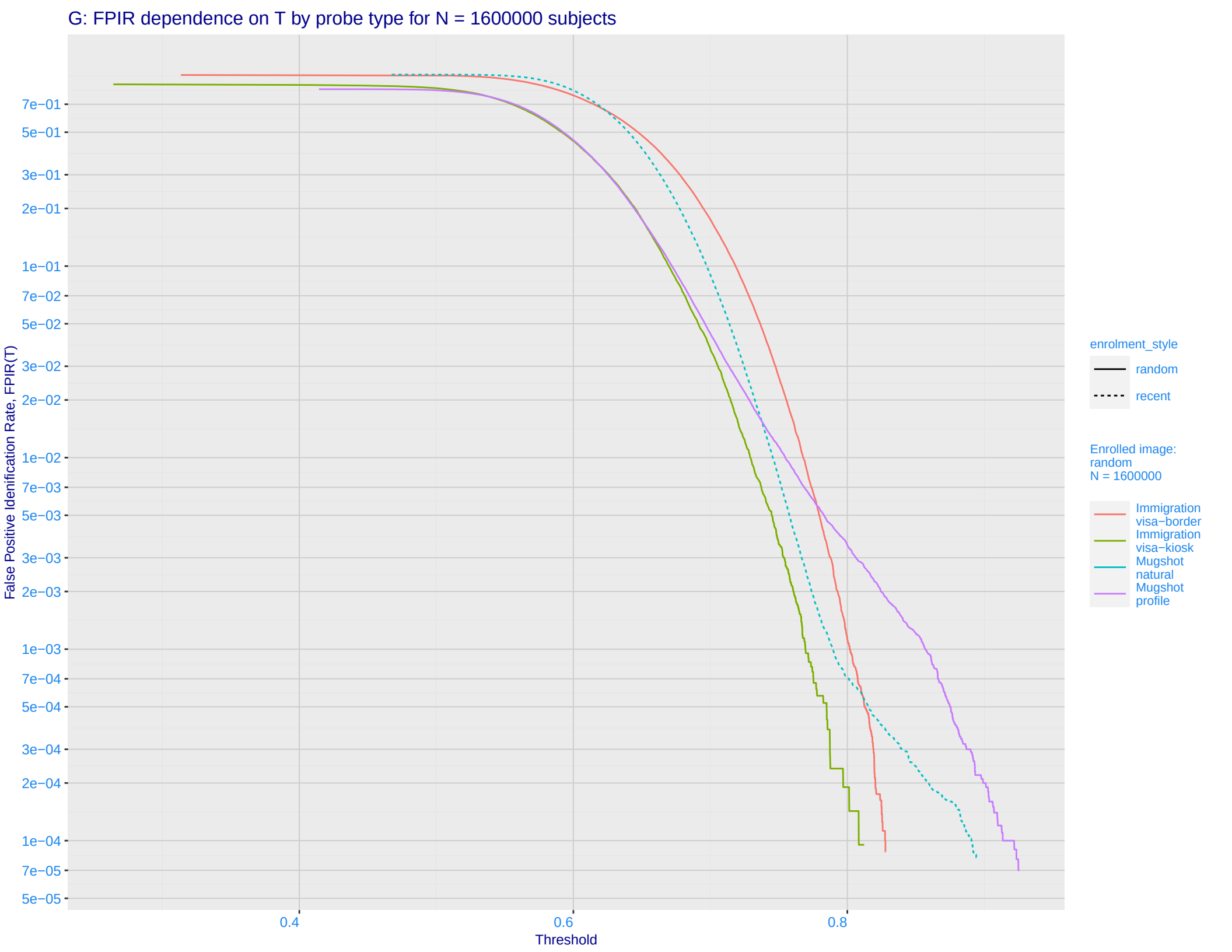
C: Evolution of accuracy for EYEDEA algorithms on three datasets 2018 − present

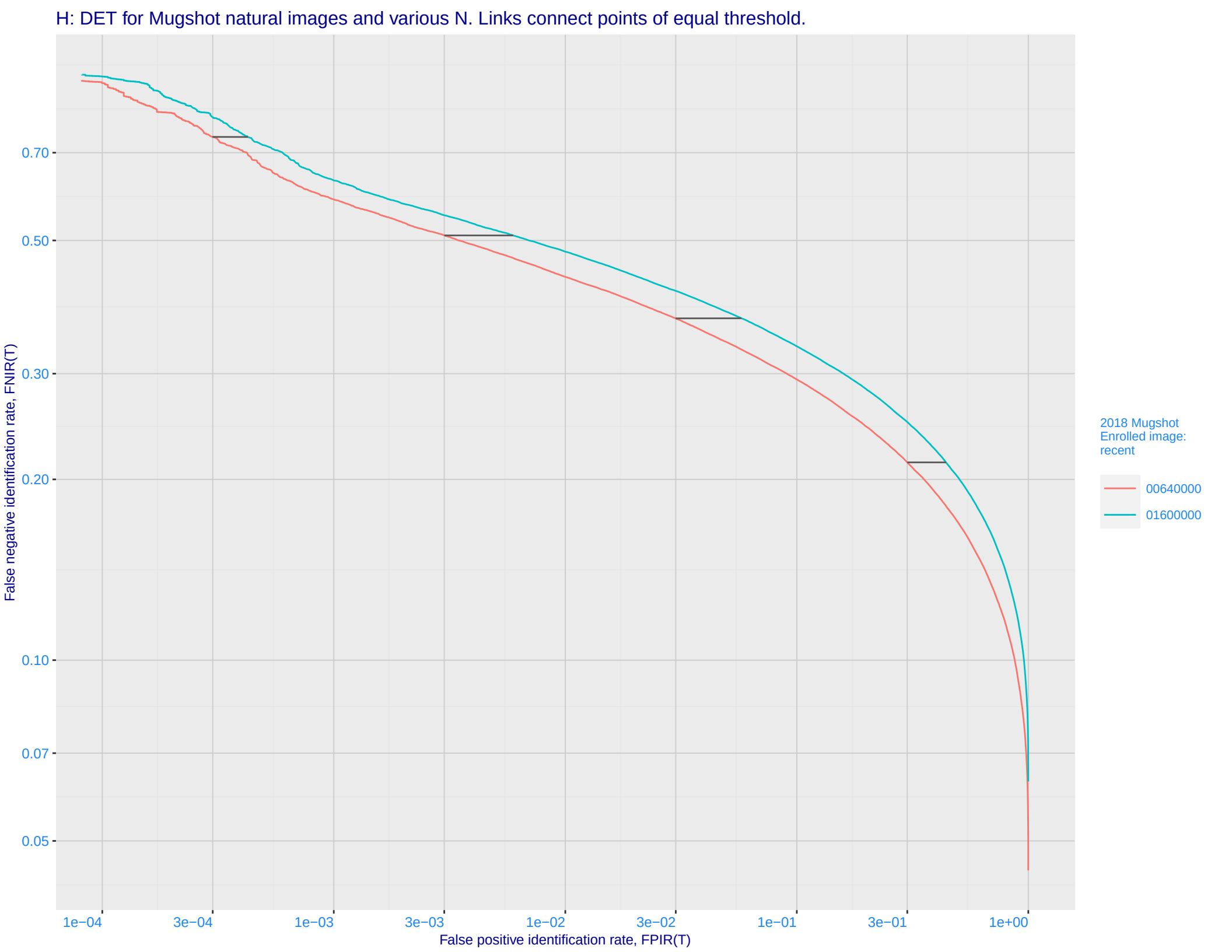


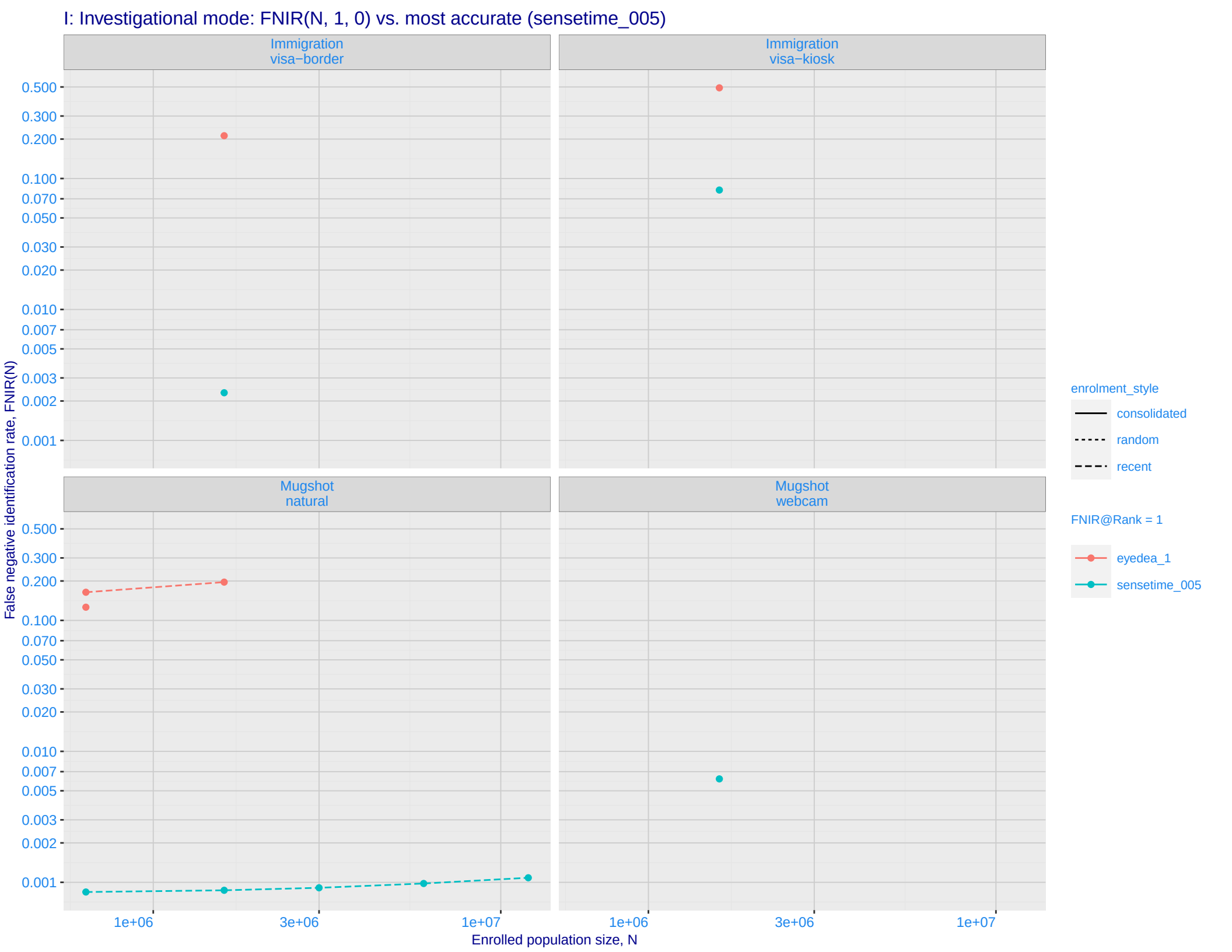

D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
eyedea_1
sensetime_004
False negative identification rate, FNIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
enrolment_style
random−ONE−MATE
recent−ONE−MATE

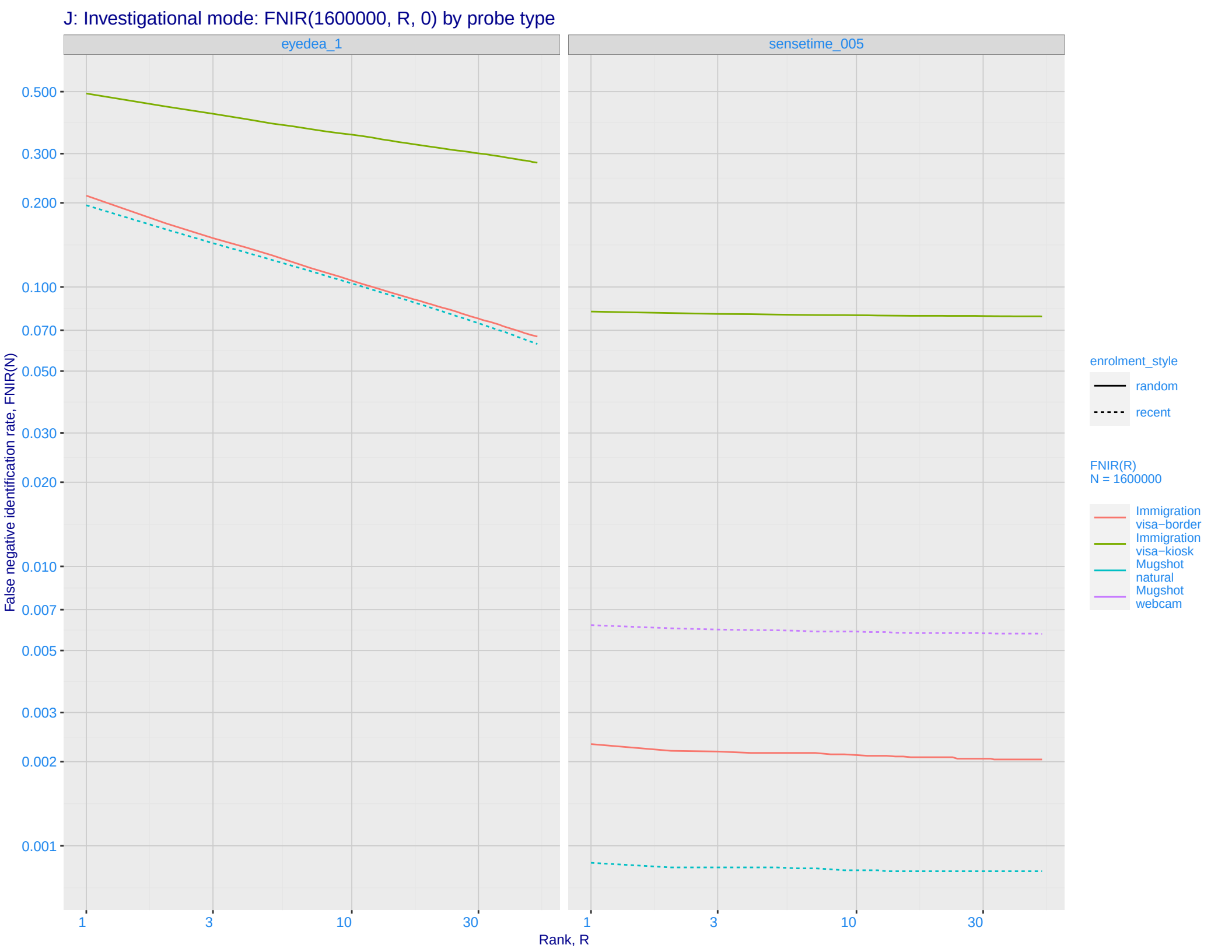

E: Dependence of error rates on T by number enrolled identities, N, for Mugshot natural images
N
00640000
01600000
lifetime_consolidated
recent
FNIR
FPIR
Identification Error rate, FPIR(T) or FNIR(T)
0.70
0.50
0.30
0.20
0.10
0.07
0.05
0.03
7e−01
5e−01
3e−01
2e−01
1e−01
7e−02
5e−02
3e−02
2e−02
1e−02
7e−03
5e−03
3e−03
2e−03
1e−03
7e−04
5e−04
3e−04
2e−04
1e−04
7e−05
0.5
0.6
0.7
0.8
0.9
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
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

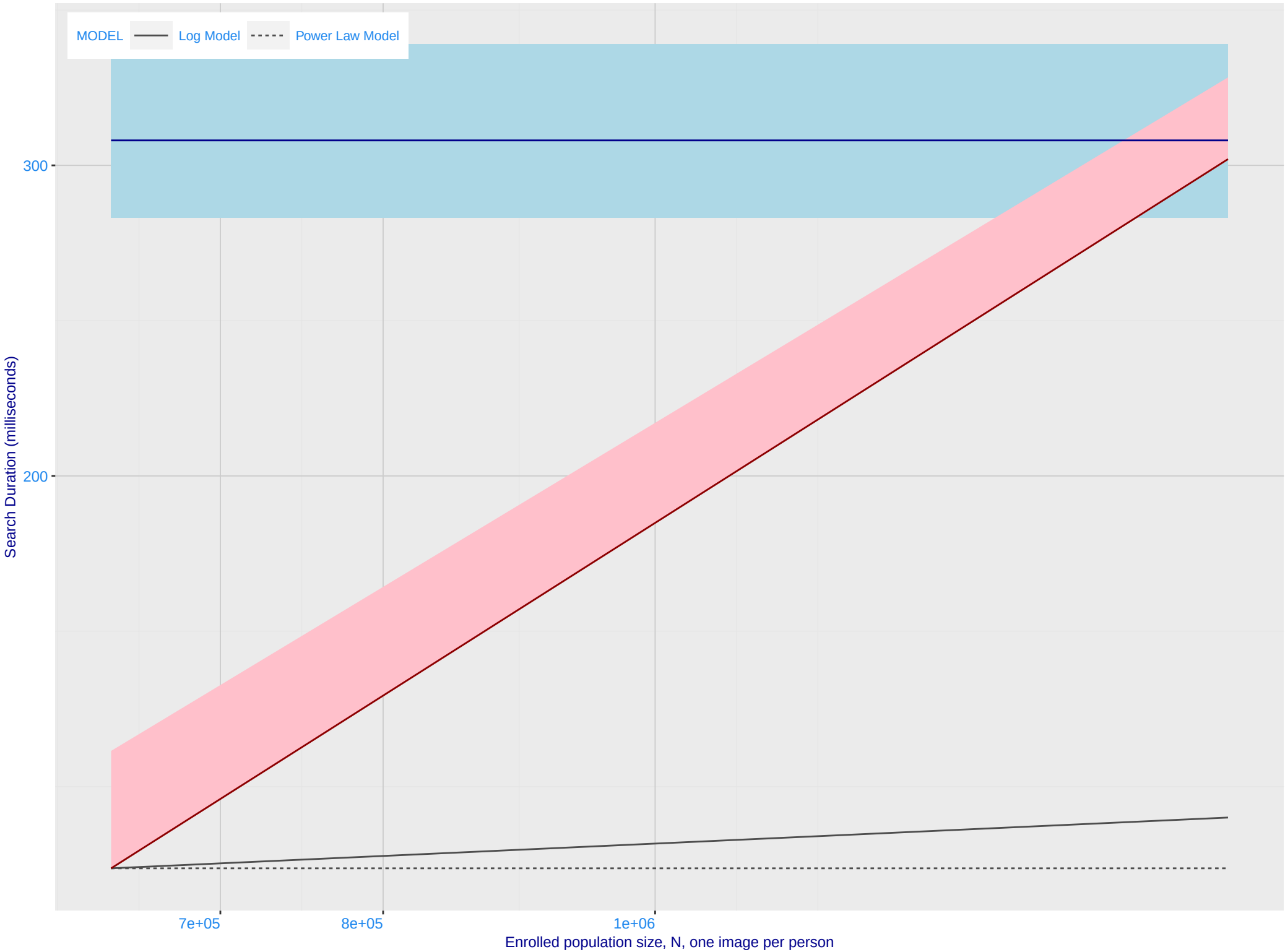

G: FPIR dependence on T by probe type for N = 1600000 subjects
False Positive Idenification Rate, FPIR(T)
7e−01
5e−01
3e−01
2e−01
1e−01
7e−02
5e−02
3e−02
2e−02
1e−02
7e−03
5e−03
3e−03
2e−03
1e−03
7e−04
5e−04
3e−04
2e−04
1e−04
7e−05
5e−05
0.4
0.6
0.8
Threshold
enrolment_style
random
recent
Enrolled image:
random
N = 1600000
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
Mugshot profile

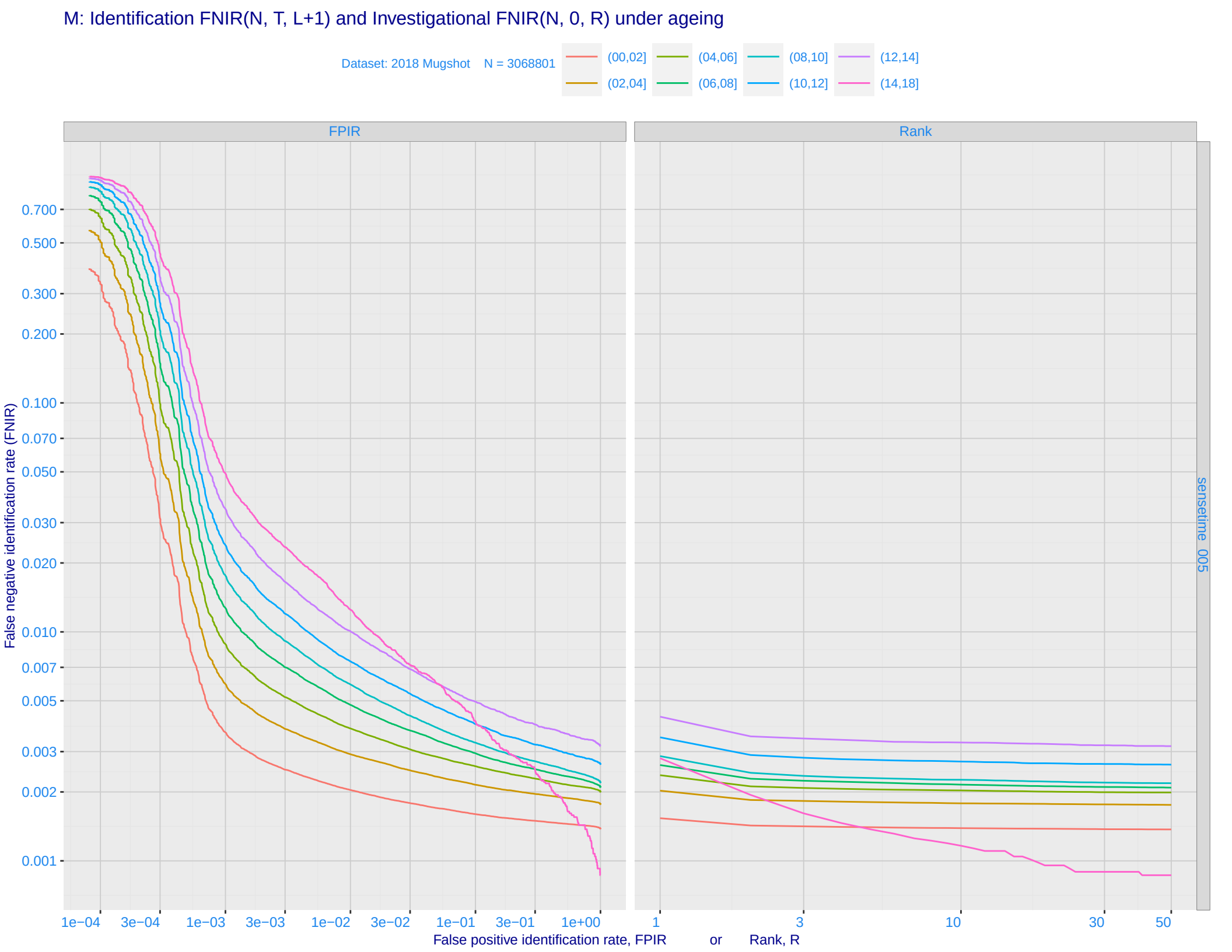

H: DET for Mugshot natural images and various N. Links connect points of equal threshold.
False negative identification rate, FNIR(T)
0.70
0.50
0.30
0.20
0.10
0.07
0.05
1e−04
3e−04
1e−03
3e−03
1e−02
3e−02
1e−01
3e−01
1e+00
False positive identification rate, FPIR(T)
2018 Mugshot
Enrolled image:
recent
00640000
01600000


I: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005)
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
Mugshot webcam
False negative identification rate, FNIR(N)
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+06
3e+06
1e+07
Enrolled population size, N
enrolment_style
consolidated
random
recent
FNIR@Rank = 1
eyedea_1
sensetime_005


J: Investigational mode: FNIR(1600000, R, 0) by probe type
eyedea_1
sensetime_005
False negative identification rate, FNIR(N)
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
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