A: Datasheet

Algorithm: microsoft_0

Developer: Microsoft

Submission Date: 2018_01_30

Template size: 512 bytes

Template time (2.5 percentile): 274 msec

Template time (median): 281 msec

Template time (97.5 percentile): 297 msec

Investigation:

Frontal mugshot ranking 76 (out of 279) −− FNIR(1600000, 0, 1) = 0.0038 vs. lowest 0.0009 from sensetime_005

Mugshot webcam ranking 88 (out of 241) −− FNIR(1600000, 0, 1) = 0.0206 vs. lowest 0.0062 from sensetime_005

Immigration visa−border ranking 70 (out of 168) −− FNIR(1600000, 0, 1) = 0.0101 vs. lowest 0.0013 from visionlabs_010

Immigration visa−kiosk ranking 71 (out of 165) −− FNIR(1600000, 0, 1) = 0.1422 vs. lowest 0.0568 from cloudwalk_hr_000

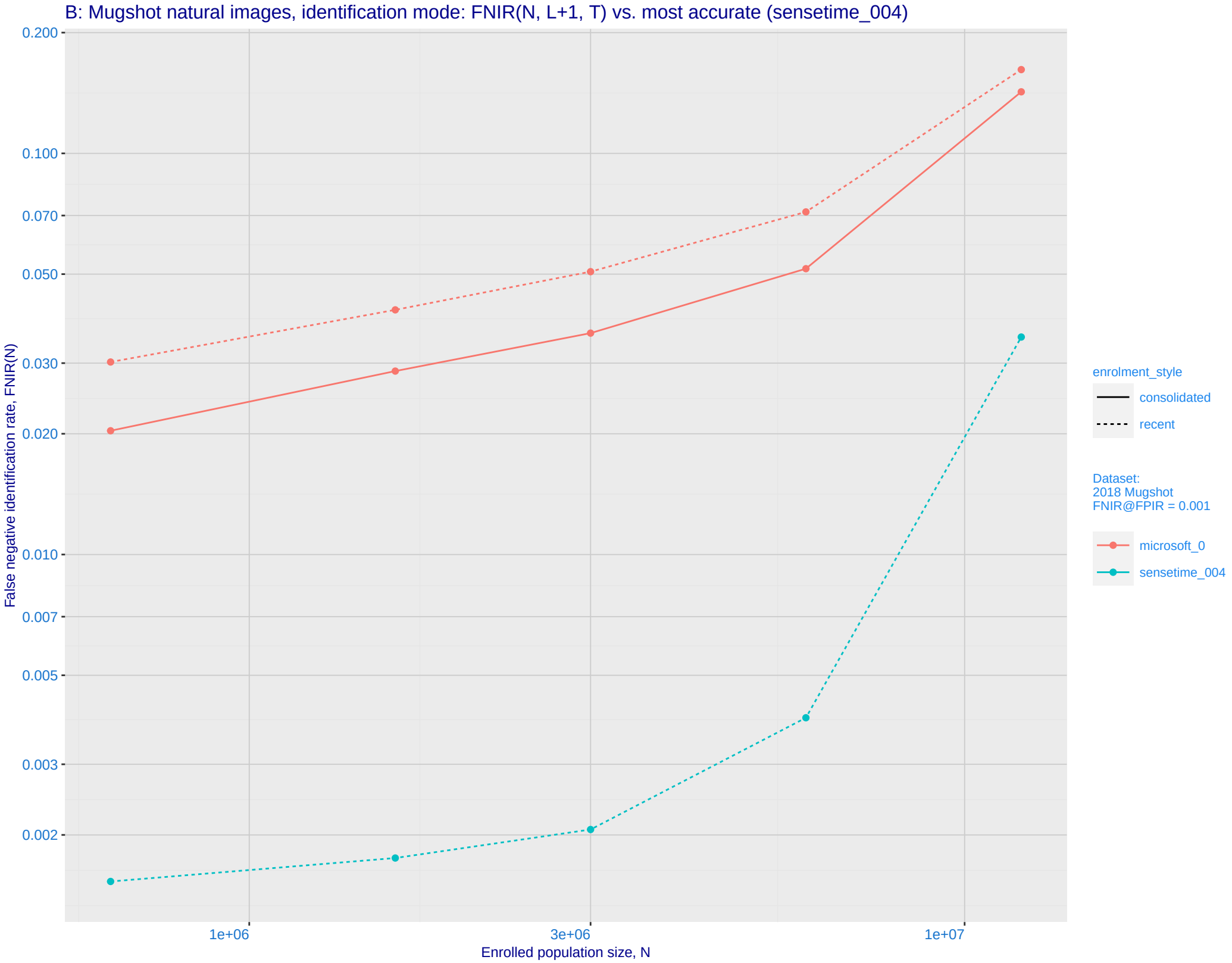
Identification:

Frontal mugshot ranking 73 (out of 279) −− FNIR(1600000, T, L+1) = 0.0407, FPIR=0.001000 vs. lowest 0.0018 from sensetime_004

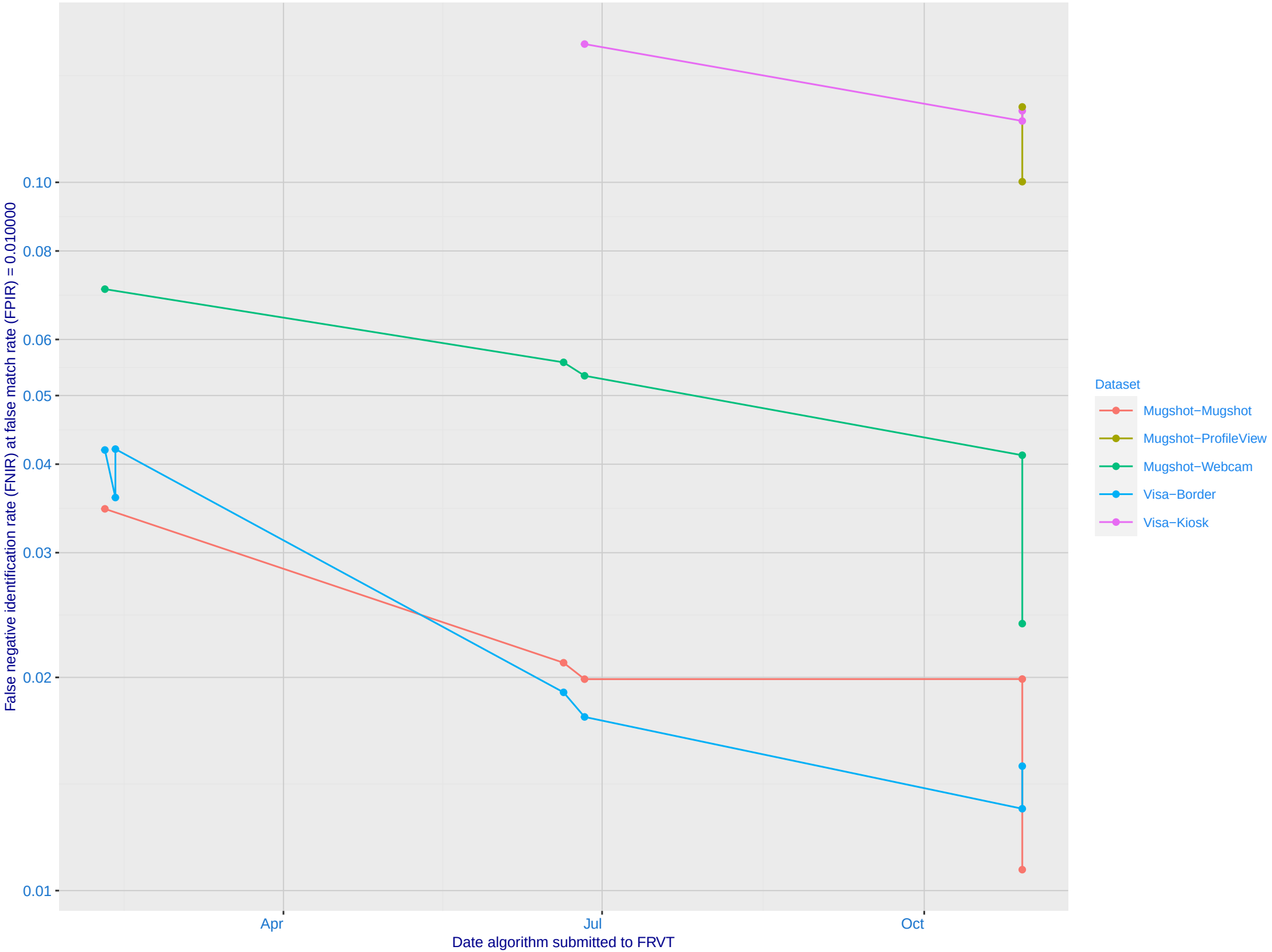
Mugshot webcam ranking 86 (out of 236) −− FNIR(1600000, T, L+1) = 0.1145, FPIR=0.001000 vs. lowest 0.0122 from sensetime_003

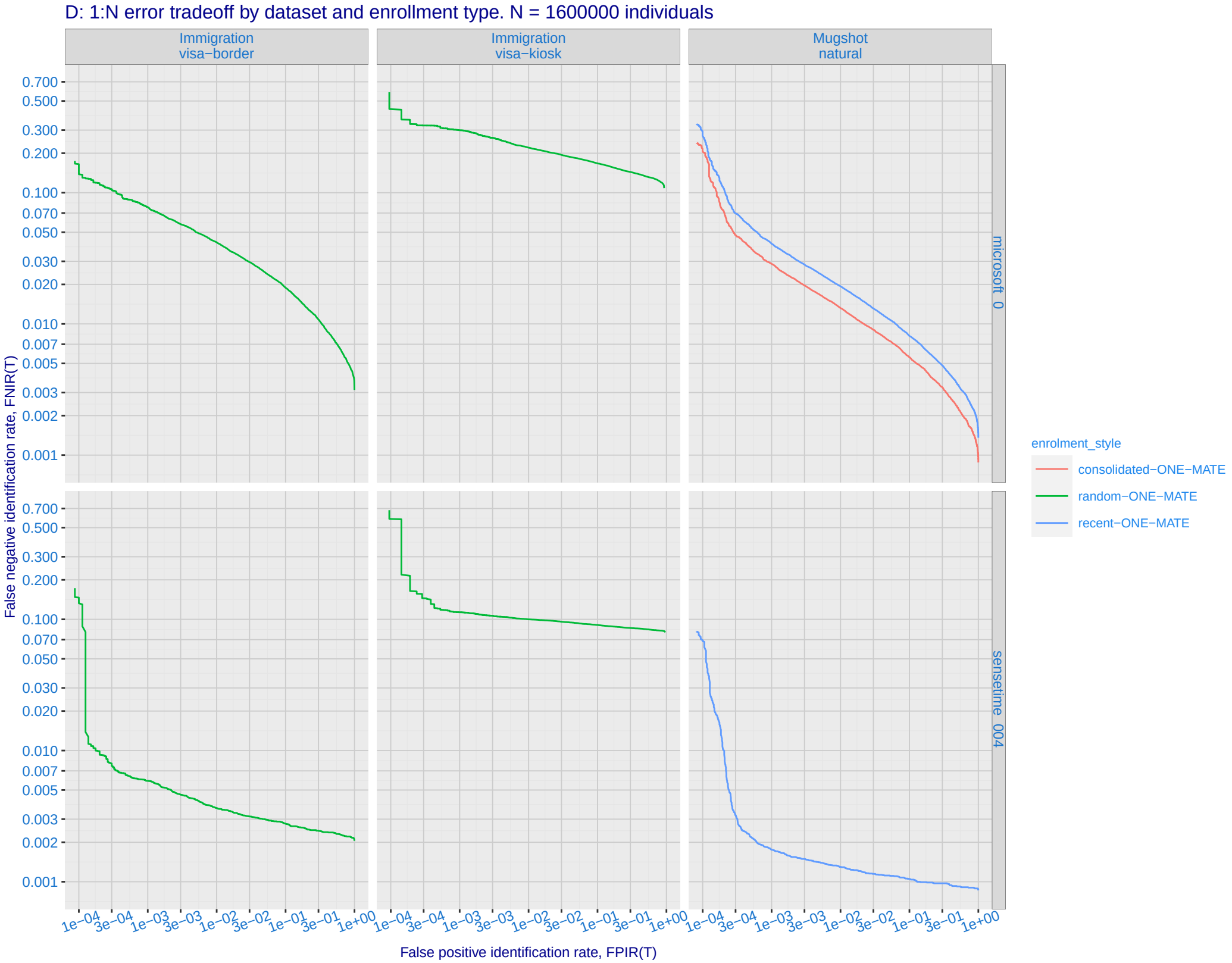
Immigration visa−border ranking 74 (out of 167) −− FNIR(1600000, T, L+1) = 0.0774, FPIR=0.001000 vs. lowest 0.0047 from idemia_008

Immigration visa−kiosk ranking 44 (out of 162) −− FNIR(1600000, T, L+1) = 0.2998, FPIR=0.001000 vs. lowest 0.0996 from cloudwalk_hr_000

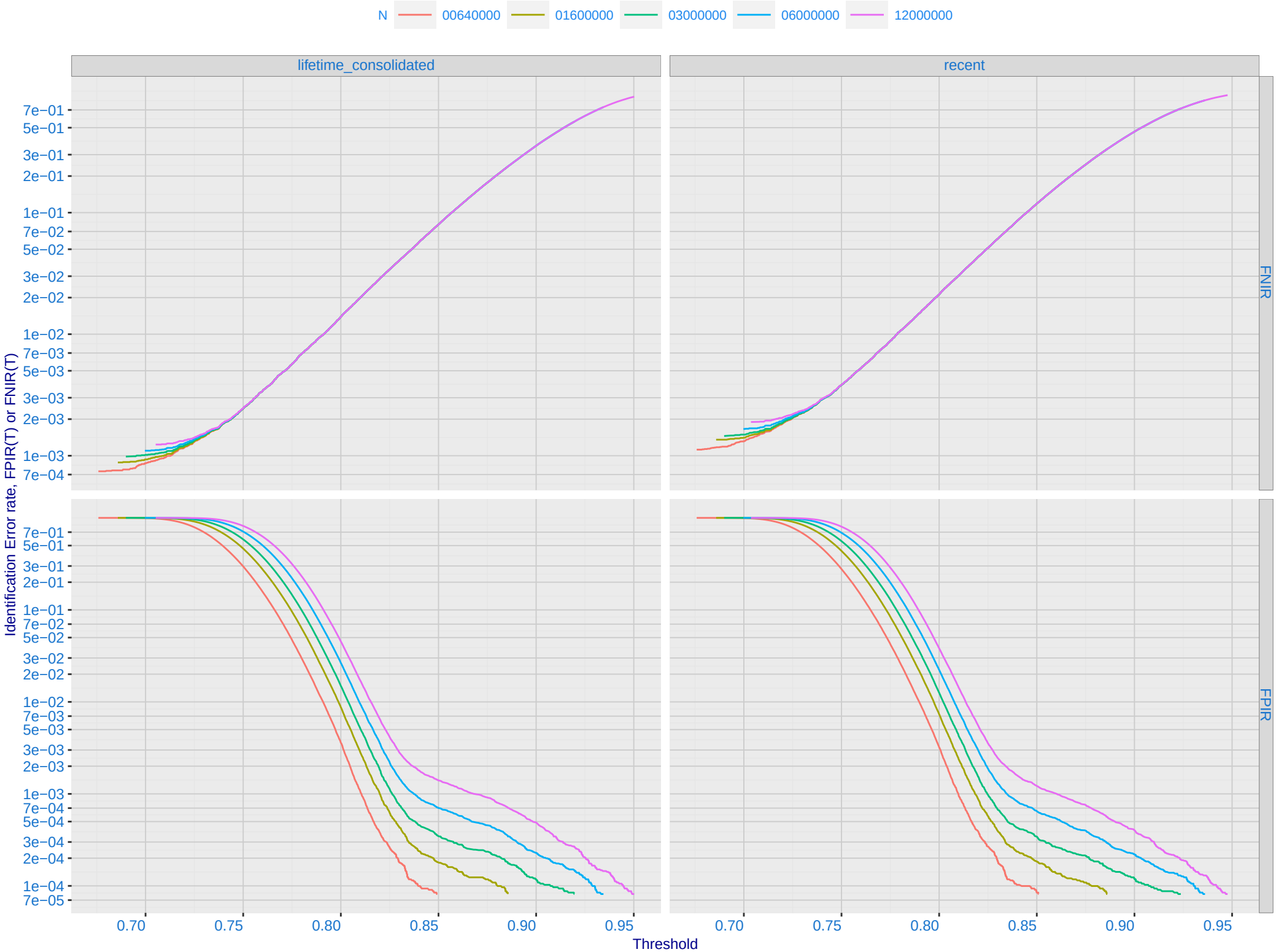

B: Mugshot natural images, identification mode: FNIR(N, L+1, T) vs. most accurate (sensetime_004)
False negative identification rate, FNIR(N)
0.200
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
1e+06
3e+06
1e+07
Enrolled population size, N
enrolment_style
consolidated
recent
Dataset:
2018 Mugshot
FNIR@FPIR = 0.001
microsoft_0
sensetime_004

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

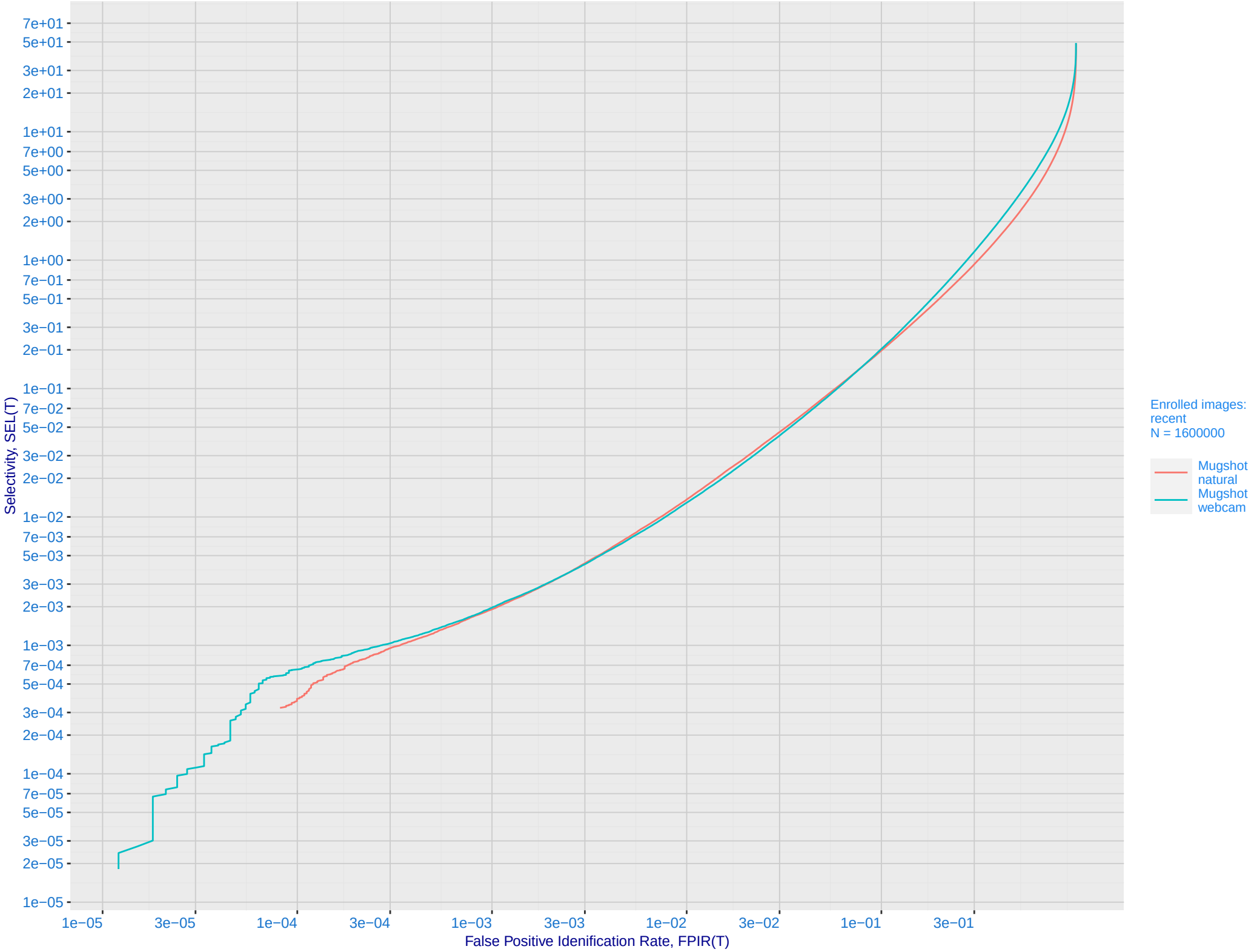


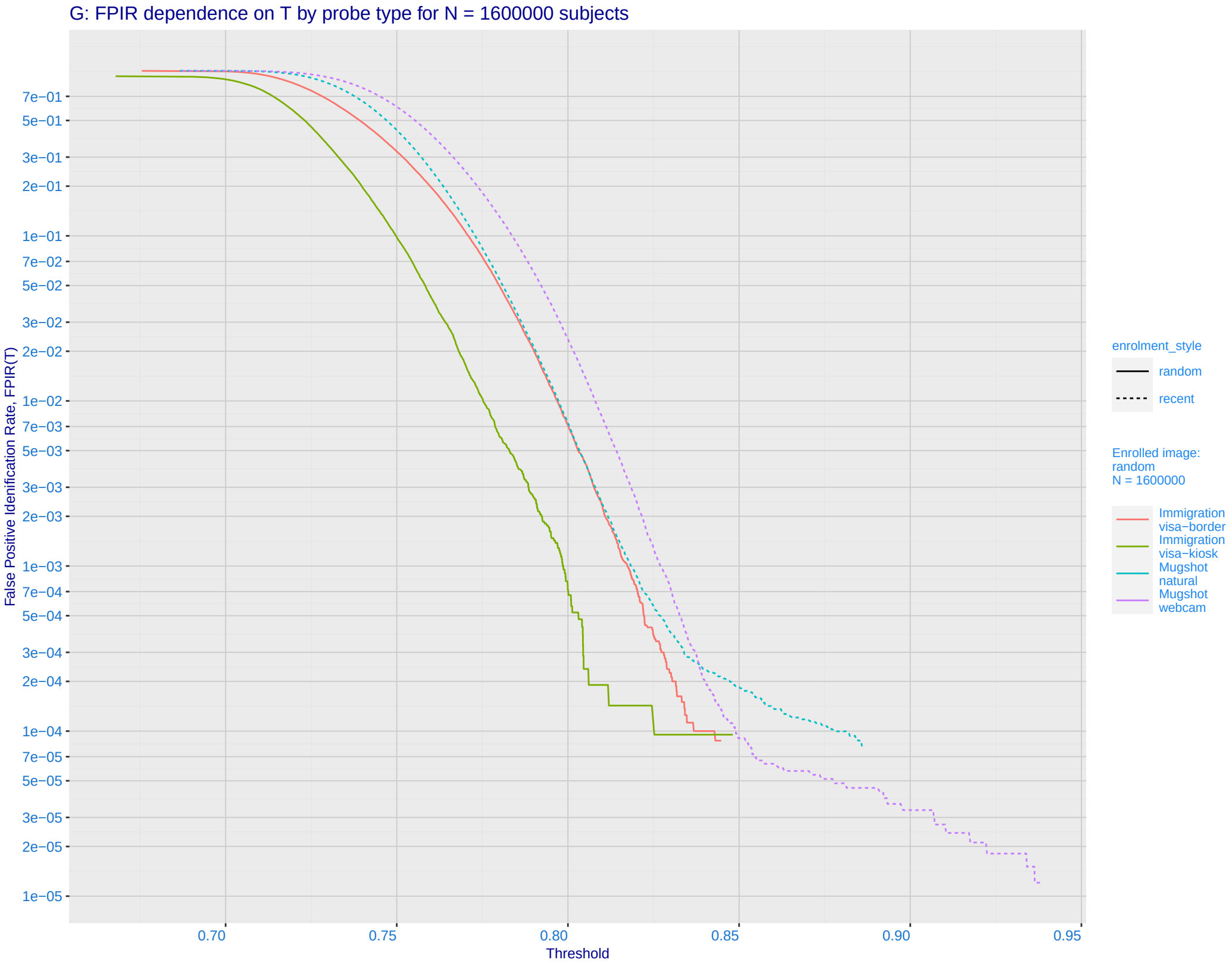

D: 1:N error tradeoff by dataset and enrollment type. N = 1600000 individuals
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
microsoft_0
sensetime_004
False negative identification rate, FNIR(T)
False positive identification rate, FPIR(T)
0.700
0.500
0.300
0.200
0.100
0.070
0.050
0.030
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
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

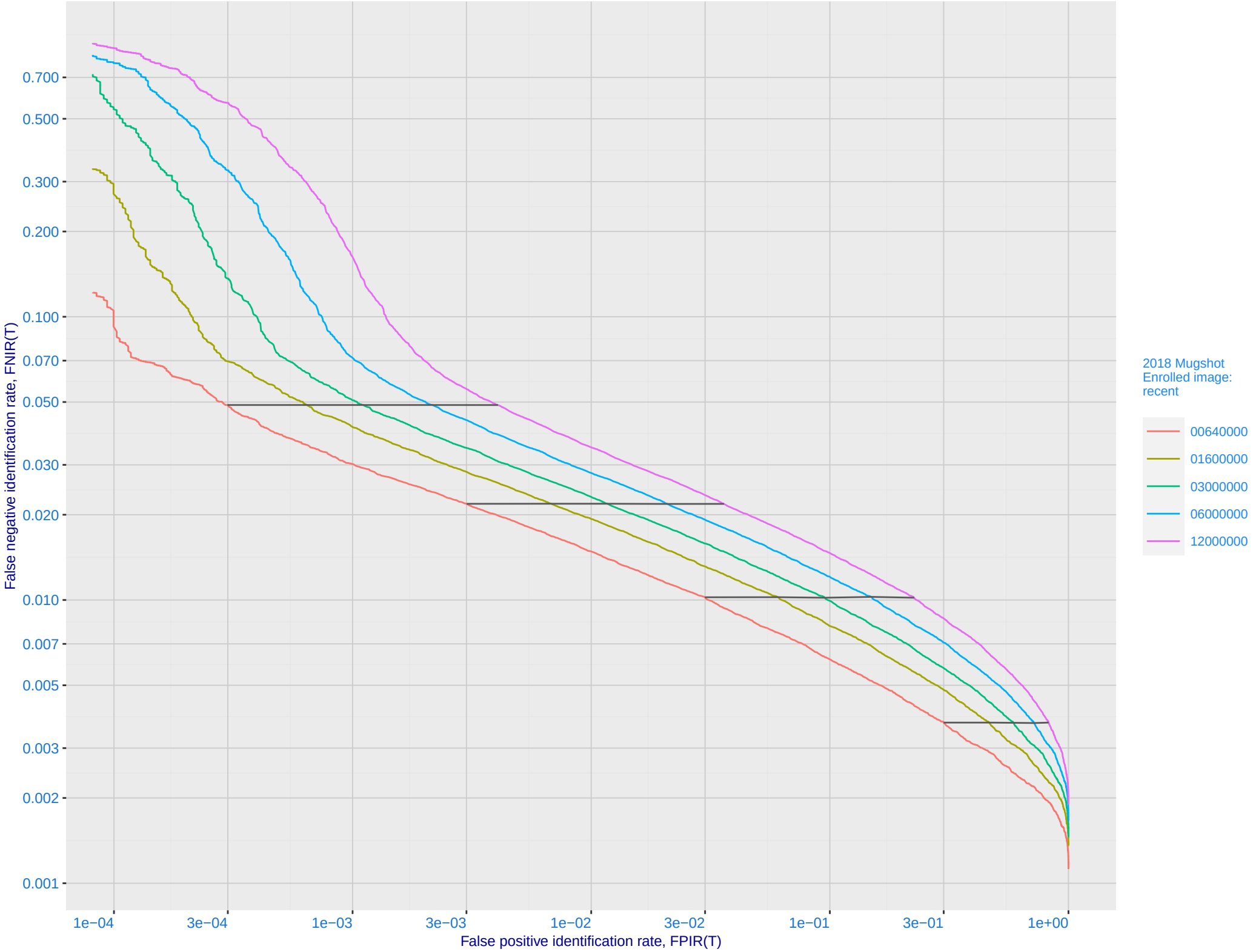


F: FPIR vs. Selectivity for mugshot images, N = 1600000 subjects enrolled with one recent mate

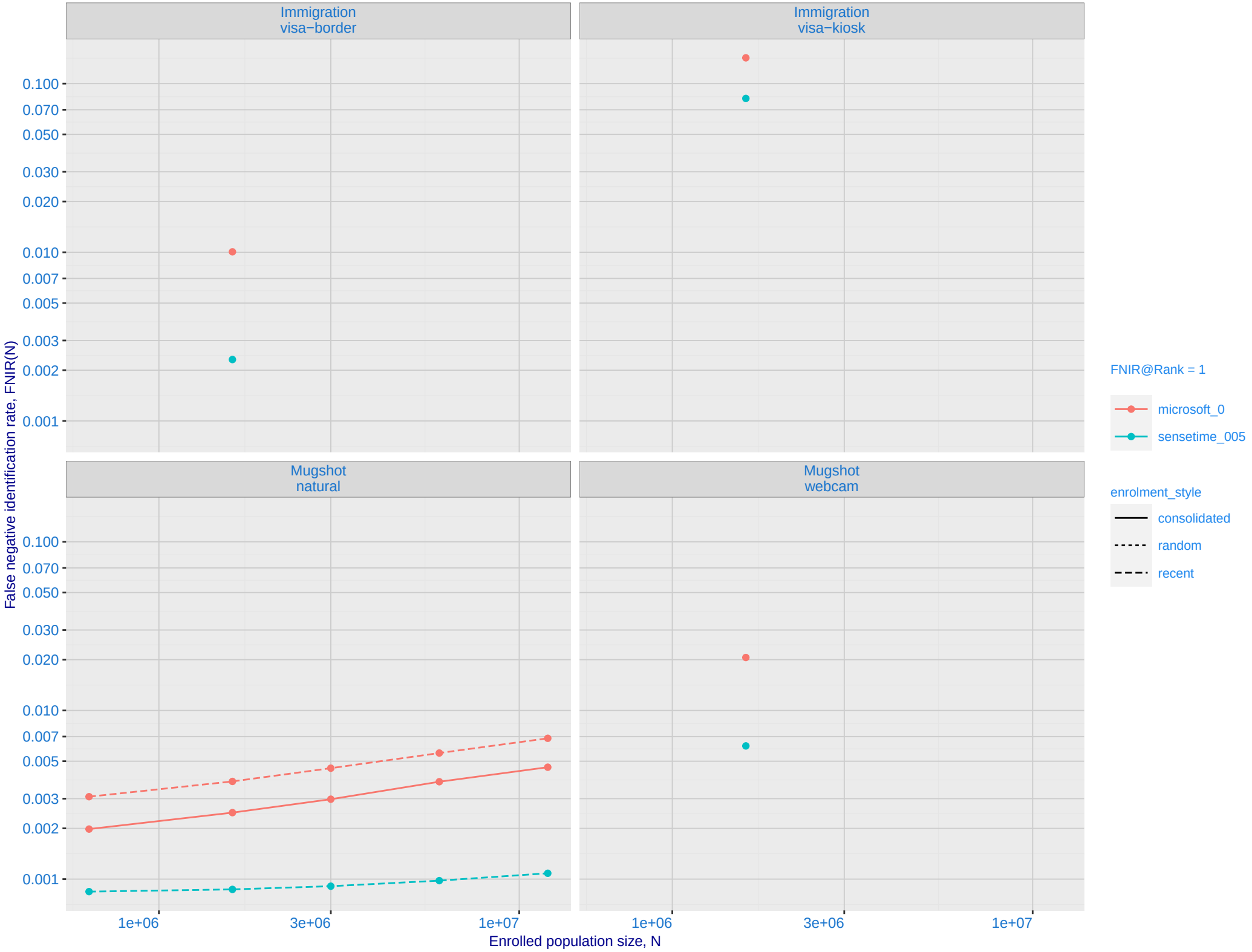


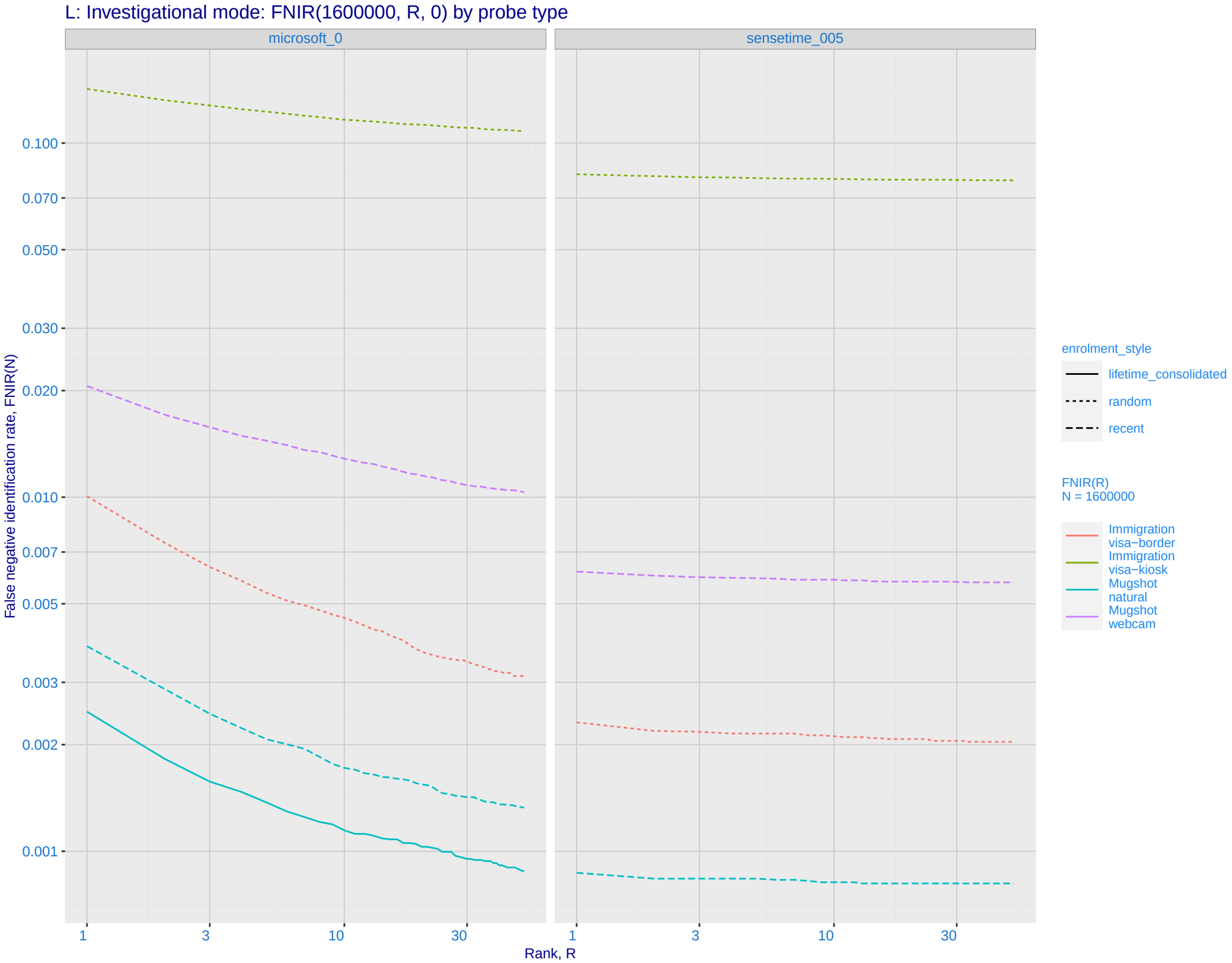

G: FPIR dependence on T by probe type for N = 1600000 subjects
False Positive Idenification Rate, FPIR(T)
7e−01
5e−01
3e−01
2e−01
1e−01
7e−02
5e−02
3e−02
2e−02
1e−02
7e−03
5e−03
3e−03
2e−03
1e−03
7e−04
5e−04
3e−04
2e−04
1e−04
7e−05
5e−05
3e−05
2e−05
1e−05
0.70
0.75
0.80
0.85
0.90
0.95
Threshold
enrolment_style
random
recent
Enrolled image:
random
N = 1600000
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
Mugshot webcam

J: DET for Mugshot natural images and various N. Links connect points of equal threshold.

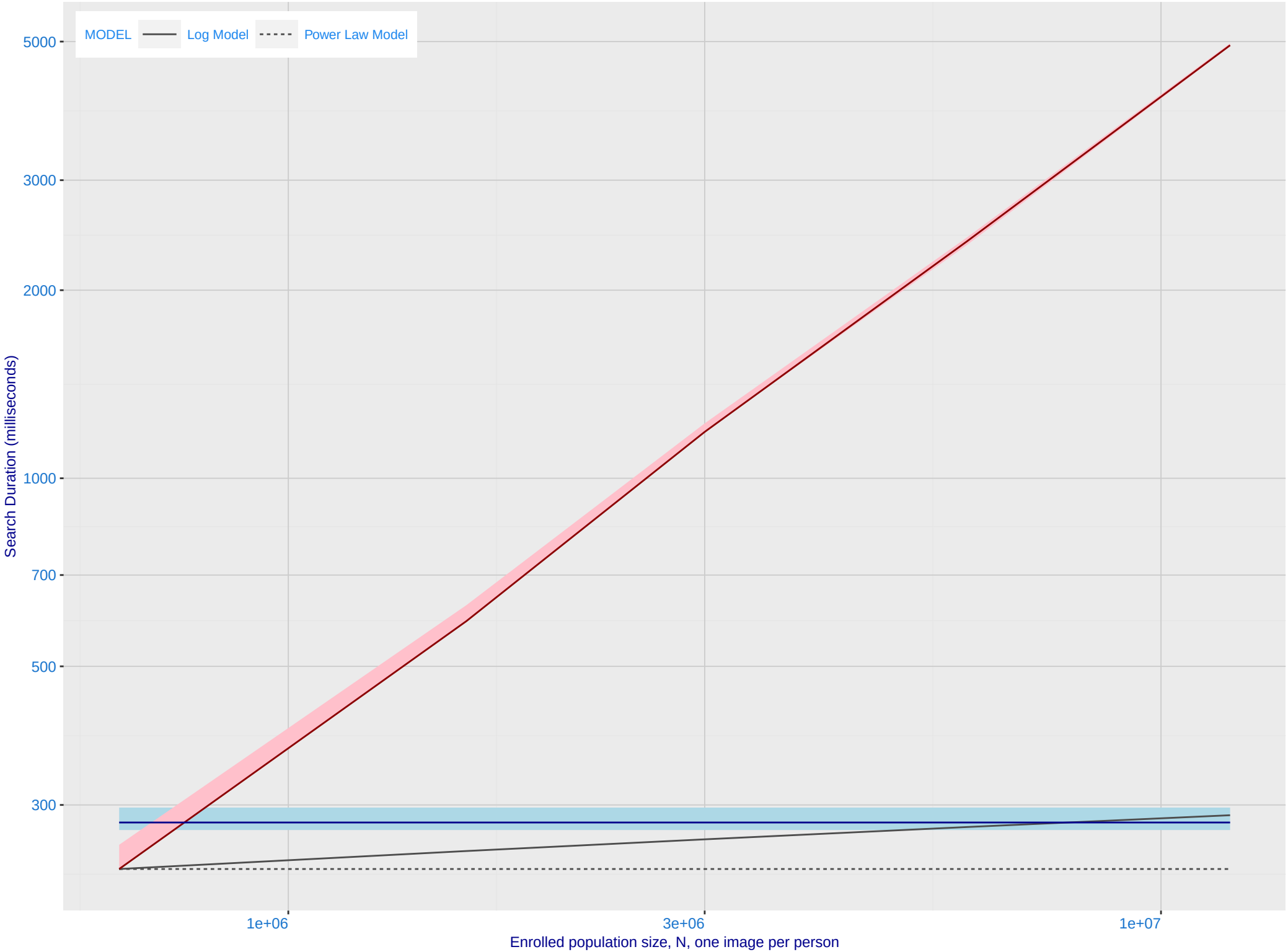


K: Investigational mode: FNIR(N, 1, 0) vs. most accurate (sensetime_005)

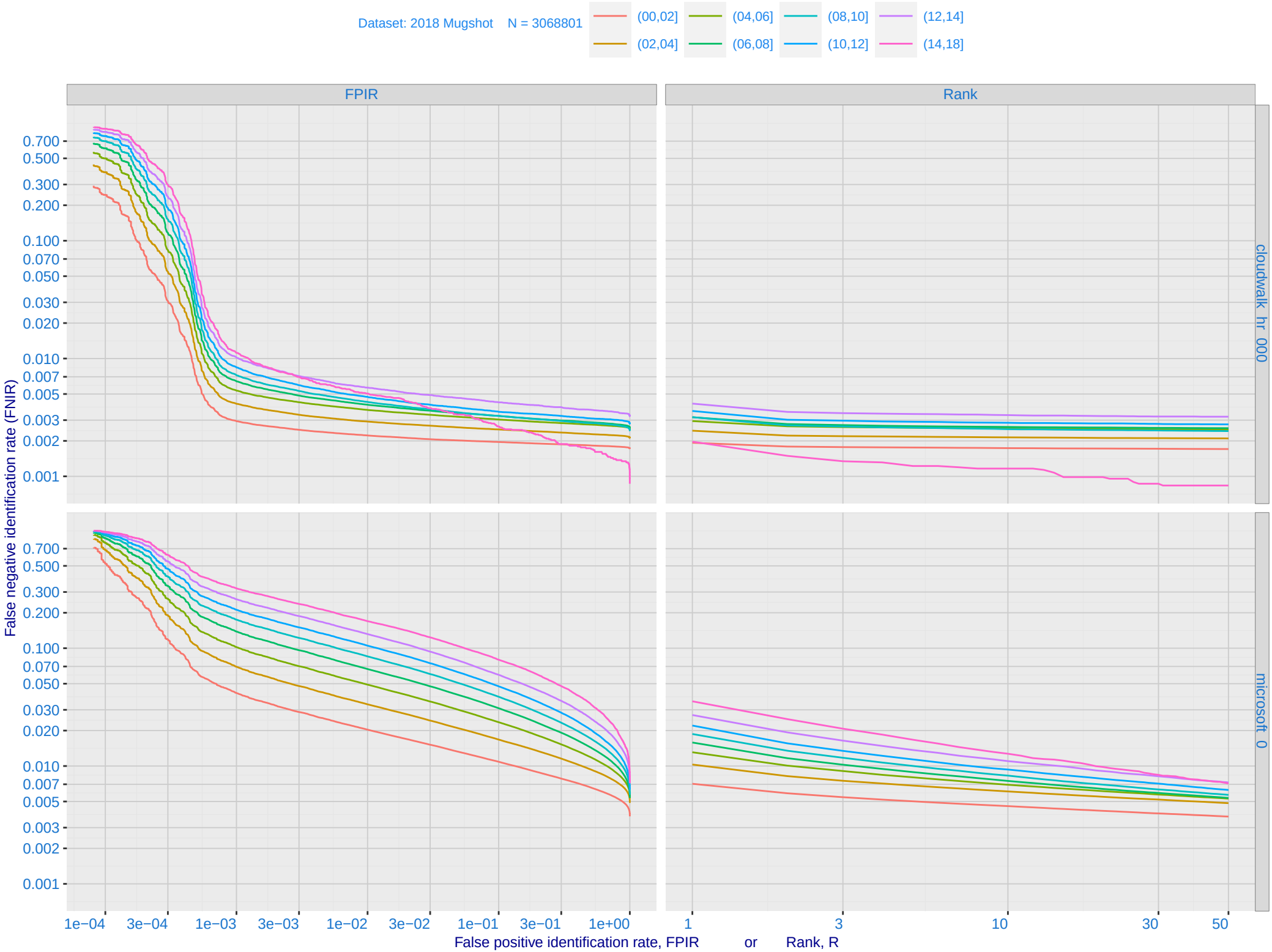
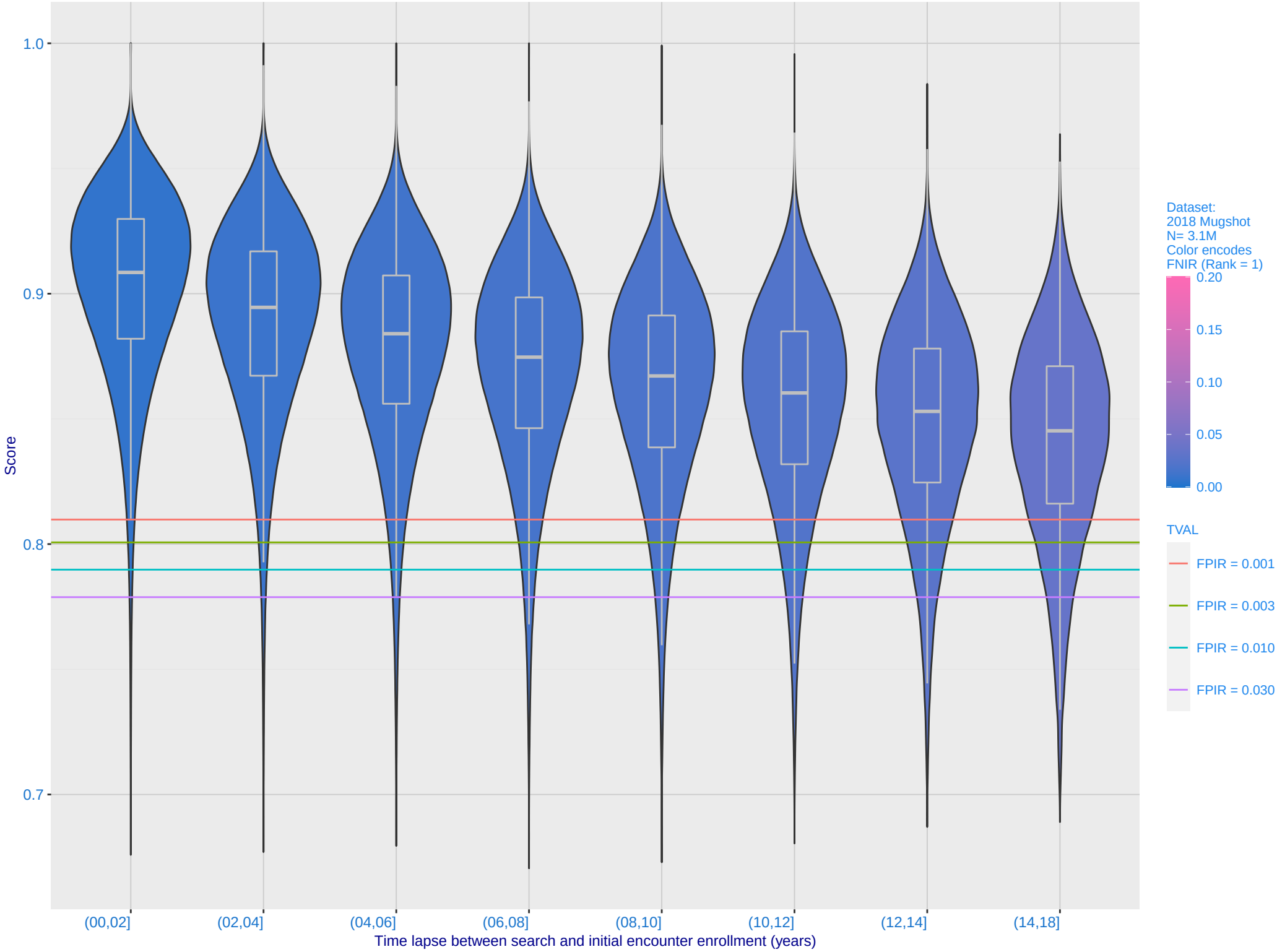



L: Investigational mode: FNIR(1600000, R, 0) by probe type
microsoft_0
sensetime_005
False negative identification rate, FNIR(N)
0.100
0.070
0.050
0.030
0.020
0.010
0.007
0.005
0.003
0.002
0.001
1
3
10
30
Rank, R
enrolment_style
lifetime_consolidated
random
recent
FNIR(R)
N = 1600000
Immigration visa−border
Immigration visa−kiosk
Mugshot natural
Mugshot webcam

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