

Participant Results

Proprietary Fingerprint Template Evaluation II (PFT-II)

Participant 3K — Decatur Industries Inc

Image Group

Information Access Division

Information Technology Laboratory

NIST
**National Institute of
Standards and Technology**
U.S. Department of Commerce

Contents

1	1K Sample Evaluation	3
2	Full Evaluation	5
3	Original PFT Dataset	13

List of Figures

1	1K Sample Evaluation – Template Size Distribution	3
2	1K Sample Evaluation – Enrollment and Comparison Timing	4
3	Full Evaluation – DET for POEBVA, DHS2, AZLA, and combined from R Index, L Index, and R/L Index	5
4	Full Evaluation – DET for all finger positions from AZLA	6
5	Full Evaluation – EERs and FTEs	7
6	Full Evaluation – FMR@FNMR = (0.002, 0.005) and 95% Confidence Intervals	8
7	Full Evaluation – FNMR@FMR = 0.0001 and 95% Confidence Intervals	9
8	Original PFT Dataset – DET	13

List of Tables

1	Sample Dataset — Template Size Distribution	3
2	Enrollment Times (sec)	4
3	Comparison Times (sec)	4
4	EER and FTE — Dataset AZLA	10
5	EER and FTE — Dataset DHS2	10
6	EER and FTE — Dataset POEBVA	10
7	Details for FNMR@FMR = 0.0001 and FMR@FNMR = (0.002, 0.005) — Dataset AZLA	11
8	Details for FNMR@FMR = 0.0001 and FMR@FNMR = (0.002, 0.005) — Dataset DHS2	12
9	Details for FNMR@FMR = 0.0001 and FMR@FNMR = (0.002, 0.005) — Dataset POEBVA	12
10	Details for EER, FNMR@FMR = 0.0001, and FMR@FNMR = 0.005 — Original PFT Dataset	13

1 1K Sample Evaluation

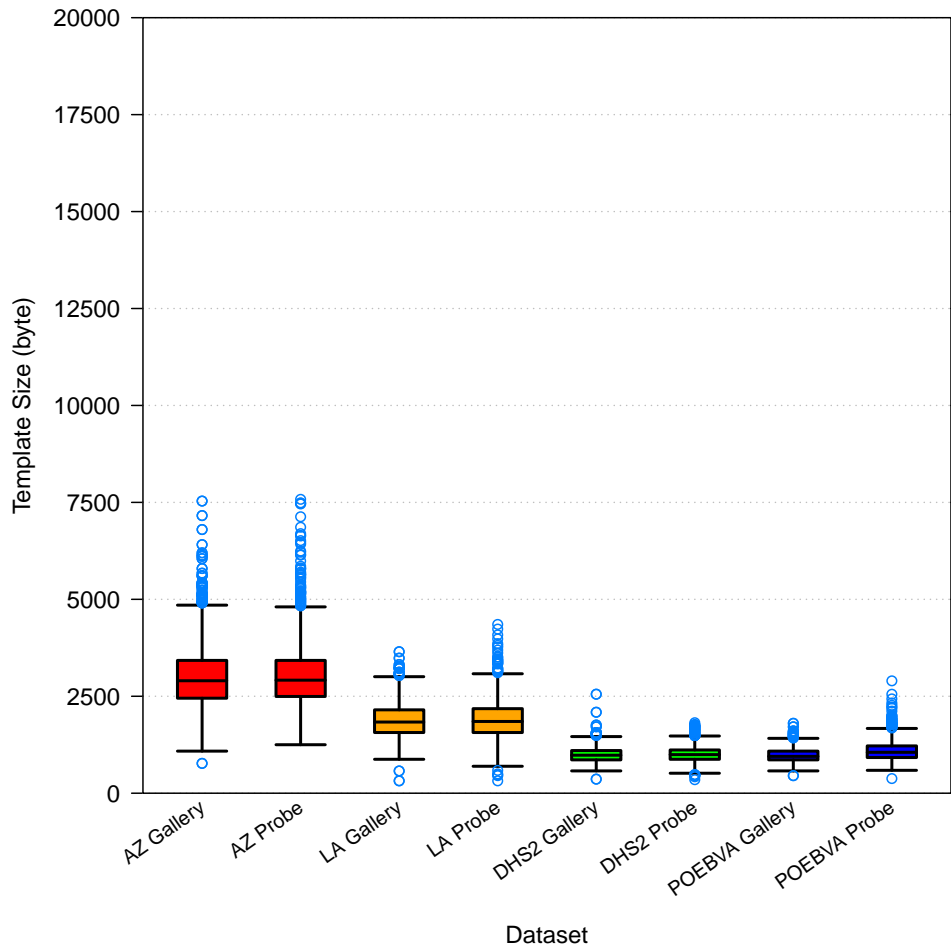


Figure 1: 1K Sample Evaluation – Template Size Distribution

	AZ		LA		DHS2		POEBVA	
	Gallery	Probe	Gallery	Probe	Gallery	Probe	Gallery	Probe
<i>Dimensions</i>	800x800	800x800	412x1000	400x776	368x368	368x368	500x500	368x368
<i>Maximum</i>	7535	7580	3650	4355	2555	1820	1805	2900
75%	3425	3425	2150	2180	1100	1115	1085	1220
<i>Median</i>	2900	2915	1835	1850	980	995	950	1055
25%	2450	2495	1565	1565	860	875	860	920
<i>Minimum</i>	770	1250	320	320	365	350	455	380

Table 1: Sample Dataset — Template Size Distribution

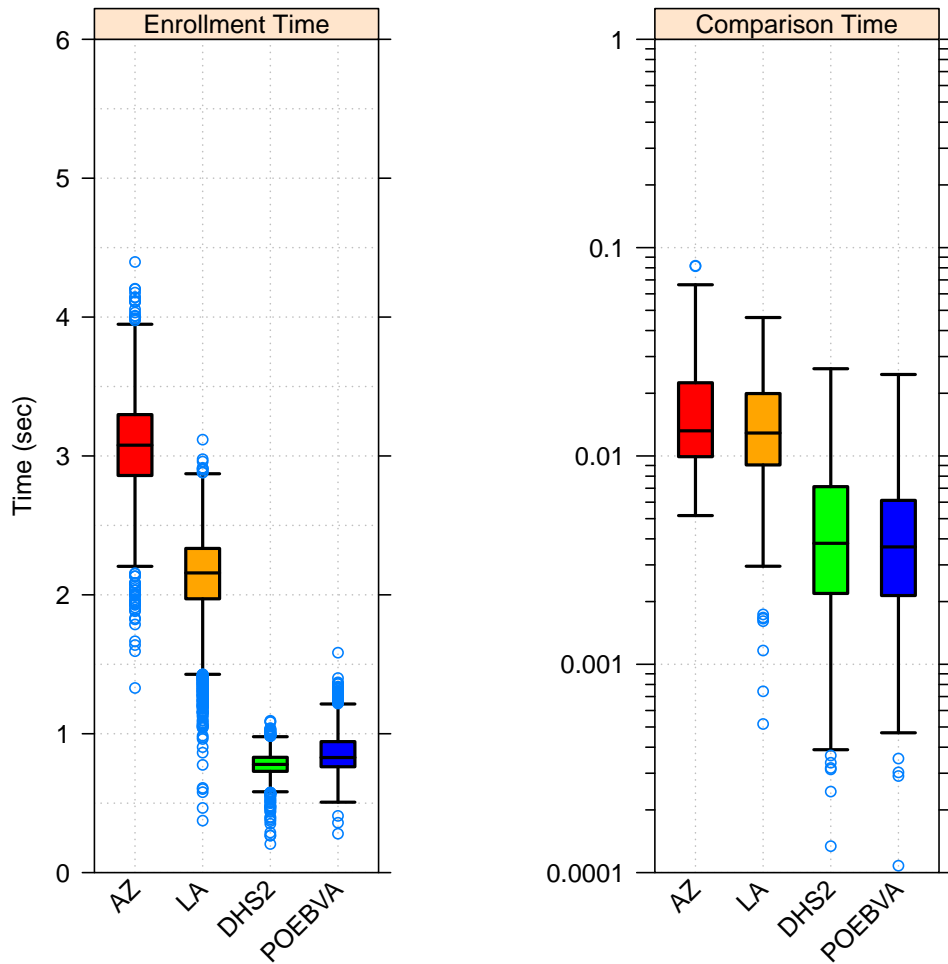


Figure 2: 1K Sample Evaluation – Enrollment and Comparison Timing

	AZ	LA	DHS2	POEBVA
<i>Maximum</i>	4.397	3.117	1.093	1.583
<i>75%</i>	3.298	2.334	0.830	0.943
<i>Median</i>	3.078	2.158	0.779	0.829
<i>25%</i>	2.859	1.971	0.729	0.762
<i>Minimum</i>	1.329	0.374	0.206	0.279

Table 2: Enrollment Times (sec)

	AZ	LA	DHS2	POEBVA
<i>Maximum</i>	0.082	0.046	0.026	0.025
<i>75%</i>	0.022	0.020	0.007	0.006
<i>Median</i>	0.013	0.013	0.004	0.004
<i>25%</i>	0.010	0.009	0.002	0.002
<i>Minimum</i>	0.005	0.000	0.000	0.000

Table 3: Comparison Times (sec)

2 Full Evaluation

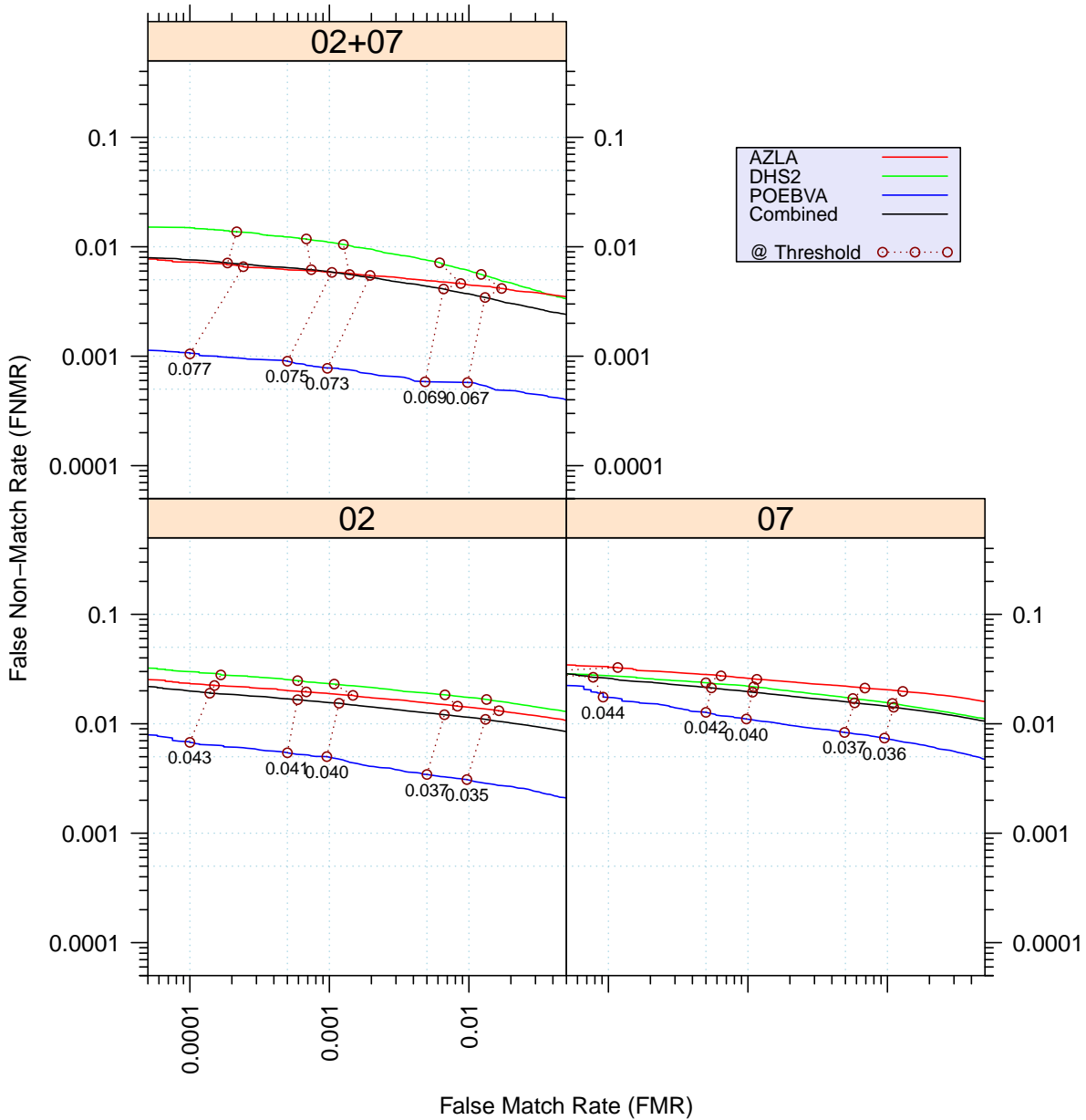


Figure 3: Full Evaluation – DET for POEBVA, DHS2, AZLA, and combined from R Index, L Index, and R/L Index

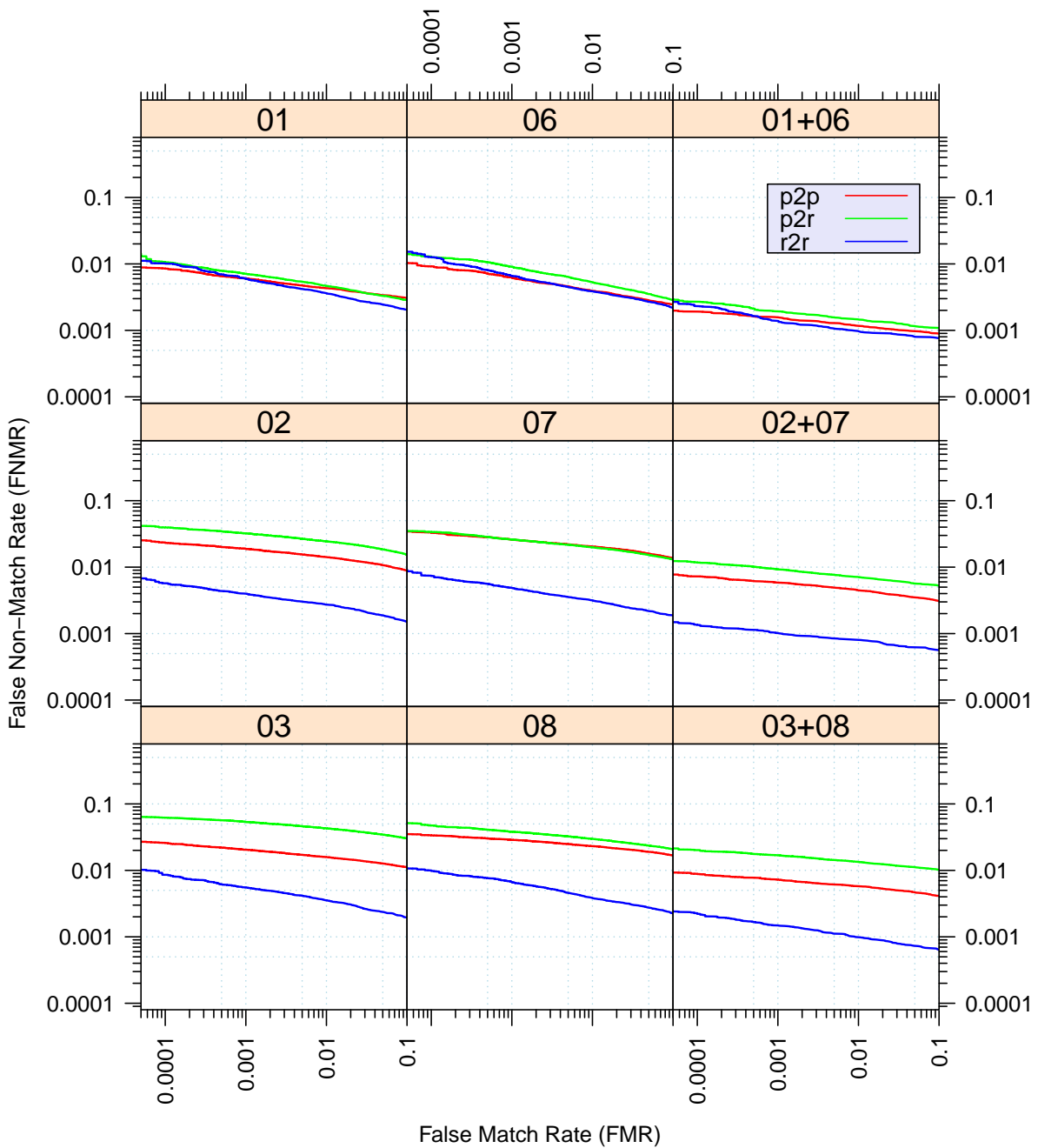


Figure 4: Full Evaluation – DET for all finger positions from AZLA

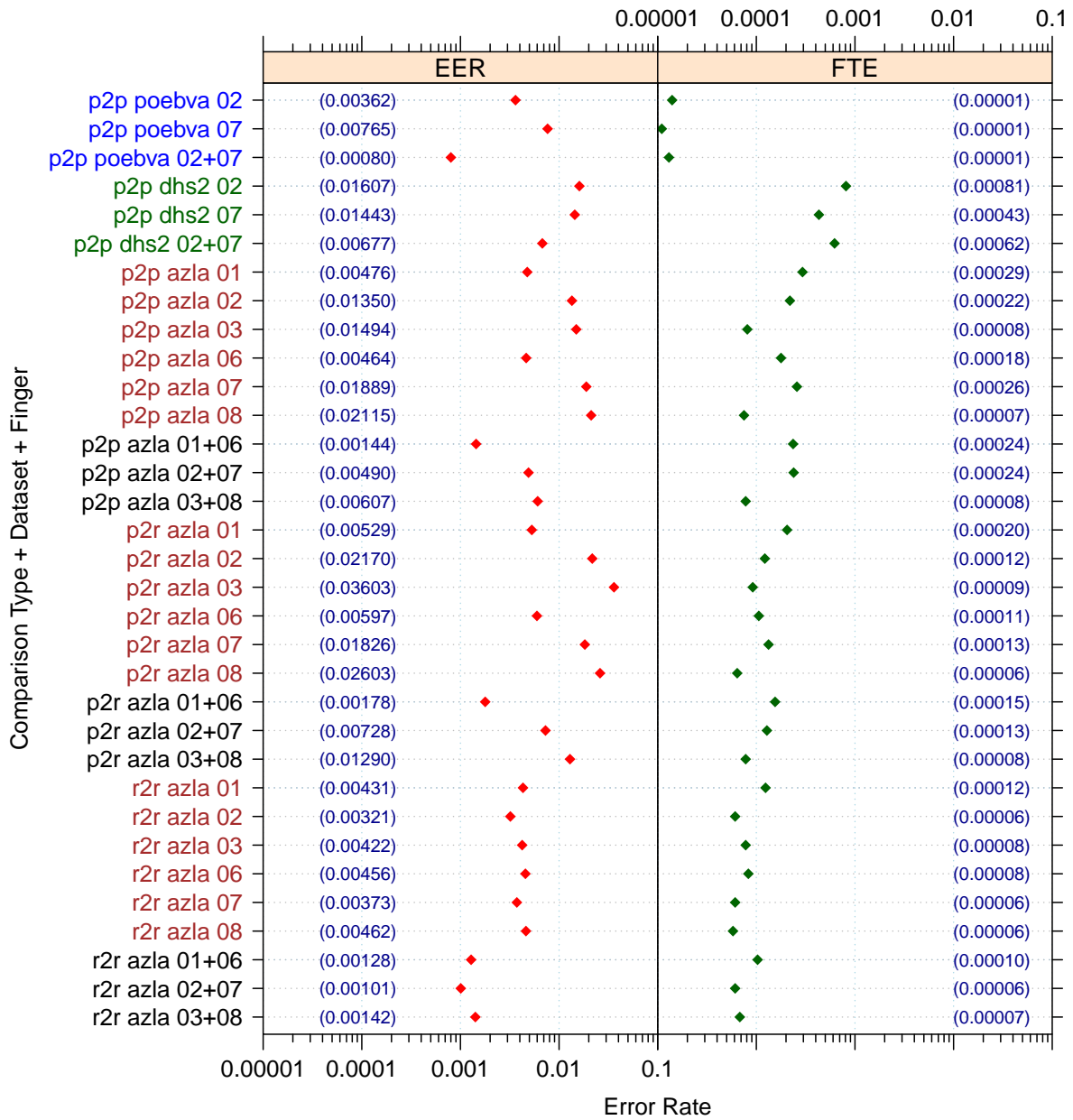


Figure 5: Full Evaluation – EERs and FTEs

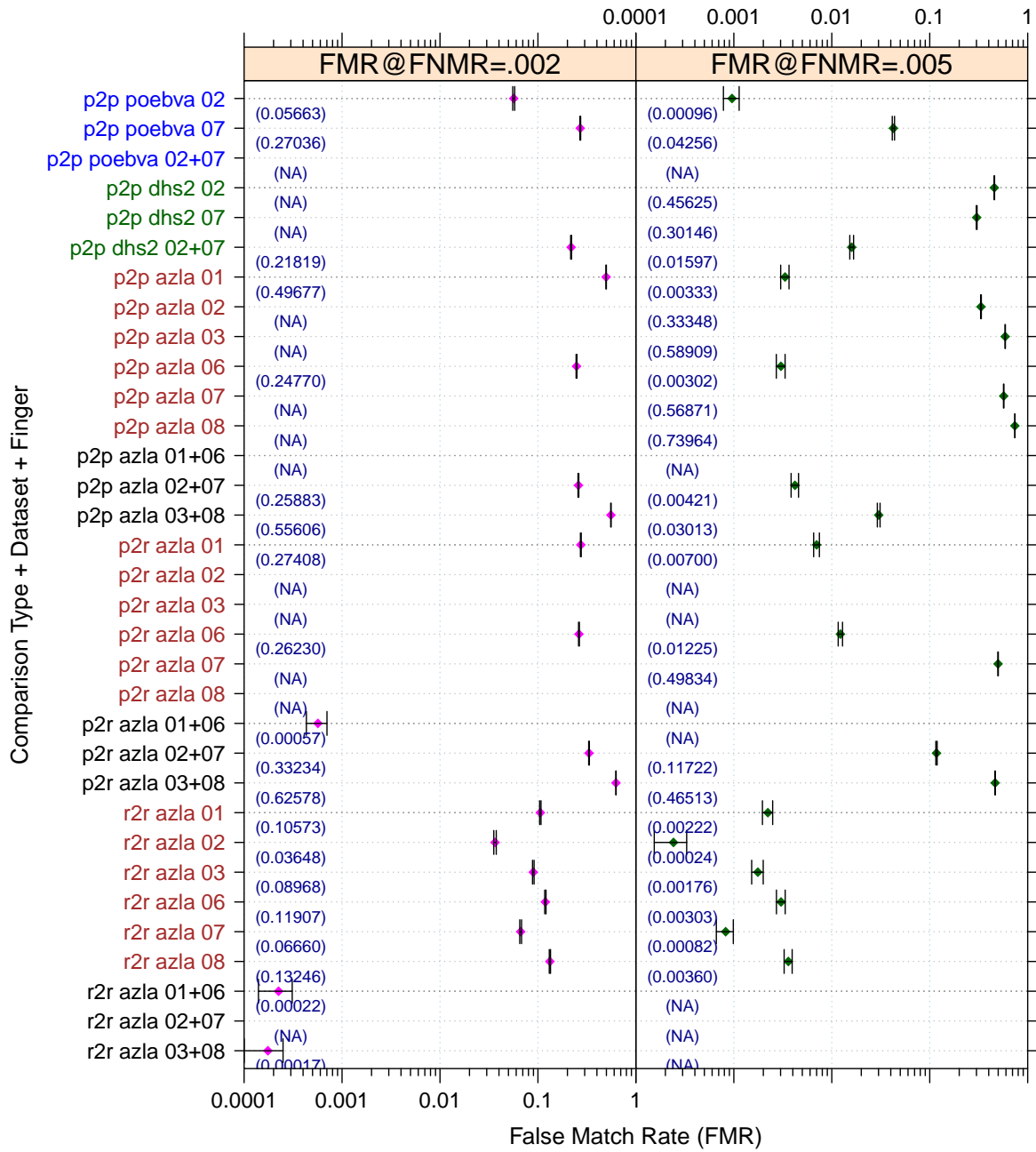


Figure 6: Full Evaluation – FMR@FNMR = (0.002, 0.005) and 95% Confidence Intervals

Note: “n/a” indicates that the value could not be reliably measured with the available sample size.

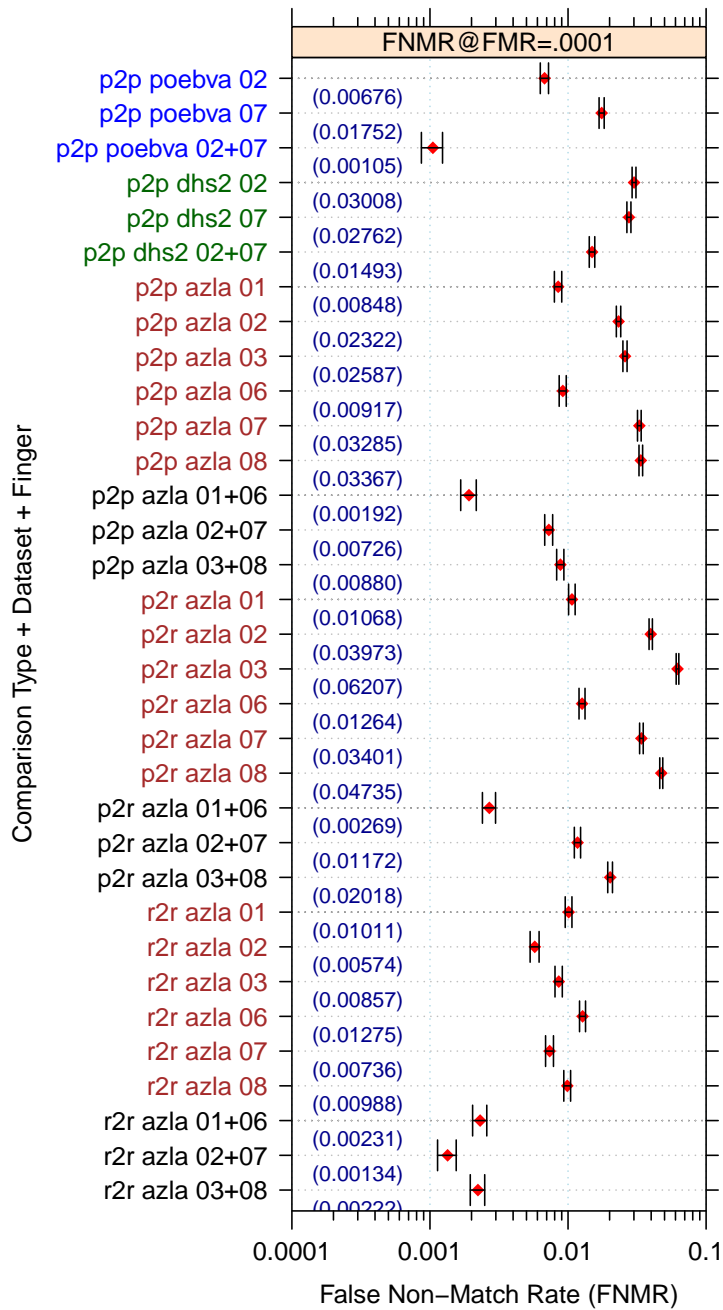


Figure 7: Full Evaluation – FNMR@FMR = 0.0001 and 95% Confidence Intervals

Note: “n/a” indicates that the value could not be reliably measured with the available sample size.

		EER	FTE Rate
Plain to Plain	<i>R Thumb</i>	0.0048	0.0003
	<i>R Index</i>	0.0135	0.0002
	<i>R Middle</i>	0.0149	0.0001
	<i>L Thumb</i>	0.0046	0.0002
	<i>L Index</i>	0.0189	0.0003
	<i>L Middle</i>	0.0211	0.0001
	<i>R/L Thumb</i>	0.0014	0.0002
	<i>R/L Index</i>	0.0049	0.0002
	<i>R/L Middle</i>	0.0061	0.0001
Plain to Rolled	<i>R Thumb</i>	0.0053	0.0002
	<i>R Index</i>	0.0217	0.0001
	<i>R Middle</i>	0.0360	0.0001
	<i>L Thumb</i>	0.0060	0.0001
	<i>L Index</i>	0.0183	0.0001
	<i>L Middle</i>	0.0260	0.0001
	<i>R/L Thumb</i>	0.0018	0.0002
	<i>R/L Index</i>	0.0073	0.0001
	<i>R/L Middle</i>	0.0129	0.0001
Rolled to Rolled	<i>R Thumb</i>	0.0043	0.0001
	<i>R Index</i>	0.0032	0.0001
	<i>R Middle</i>	0.0042	0.0001
	<i>L Thumb</i>	0.0046	0.0001
	<i>L Index</i>	0.0037	0.0001
	<i>L Middle</i>	0.0046	0.0001
	<i>R/L Thumb</i>	0.0013	0.0001
	<i>R/L Index</i>	0.0010	0.0001
	<i>R/L Middle</i>	0.0014	0.0001

Table 4: EER and FTE — Dataset AZLA

	EER	FTE Rate
<i>R Index</i>	0.0161	0.0008
<i>L Index</i>	0.0144	0.0004
<i>R/L Index</i>	0.0068	0.0006

Table 5: EER and FTE — Dataset DHS2

	EER	FTE Rate
<i>R Index</i>	0.0036	0.0000
<i>L Index</i>	0.0076	0.0000
<i>R/L Index</i>	0.0008	0.0000

Table 6: EER and FTE — Dataset POEBVA

		FNMR@FMR = 0.0001	FMR@FNMR = 0.002	FMR@FNMR = 0.005
Plain to Plain	<i>R Thumb</i>	0.0085 ±0.00052	0.4968 ±0.00283	0.0033 ±0.00033
	<i>R Index</i>	0.0232 ±0.00085	n/a	0.3335 ±0.00267
	<i>R Middle</i>	0.0259 ±0.00090	n/a	0.5891 ±0.00278
	<i>L Thumb</i>	0.0092 ±0.00054	0.2477 ±0.00244	0.0030 ±0.00031
	<i>L Index</i>	0.0328 ±0.00101	n/a	0.5687 ±0.00280
	<i>L Middle</i>	0.0337 ±0.00102	n/a	0.7396 ±0.00248
	<i>R/L Thumb</i>	0.0019 ±0.00025	0.0001 ±0.00004	n/a
	<i>R/L Index</i>	0.0073 ±0.00048	0.2588 ±0.00248	0.0042 ±0.00037
	<i>R/L Middle</i>	0.0088 ±0.00053	0.5561 ±0.00281	0.0301 ±0.00097
Plain to Rolled	<i>R Thumb</i>	0.0107 ±0.00058	0.2741 ±0.00252	0.0070 ±0.00047
	<i>R Index</i>	0.0397 ±0.00111	n/a	n/a
	<i>R Middle</i>	0.0621 ±0.00136	n/a	n/a
	<i>L Thumb</i>	0.0126 ±0.00063	0.2623 ±0.00249	0.0123 ±0.00062
	<i>L Index</i>	0.0340 ±0.00103	n/a	0.4983 ±0.00283
	<i>L Middle</i>	0.0474 ±0.00120	n/a	n/a
	<i>R/L Thumb</i>	0.0027 ±0.00029	0.0006 ±0.00014	n/a
	<i>R/L Index</i>	0.0117 ±0.00061	0.3323 ±0.00266	0.1172 ±0.00182
	<i>R/L Middle</i>	0.0202 ±0.00080	0.6258 ±0.00274	0.4651 ±0.00282
Rolled to Rolled	<i>R Thumb</i>	0.0101 ±0.00057	0.1057 ±0.00174	0.0022 ±0.00027
	<i>R Index</i>	0.0057 ±0.00043	0.0365 ±0.00106	0.0002 ±0.00009
	<i>R Middle</i>	0.0086 ±0.00052	0.0897 ±0.00162	0.0018 ±0.00024
	<i>L Thumb</i>	0.0127 ±0.00064	0.1191 ±0.00183	0.0030 ±0.00031
	<i>L Index</i>	0.0074 ±0.00048	0.0666 ±0.00141	0.0008 ±0.00016
	<i>L Middle</i>	0.0099 ±0.00056	0.1325 ±0.00192	0.0036 ±0.00034
	<i>R/L Thumb</i>	0.0023 ±0.00027	0.0002 ±0.00009	n/a
	<i>R/L Index</i>	0.0013 ±0.00021	n/a	n/a
	<i>R/L Middle</i>	0.0022 ±0.00027	0.0002 ±0.00007	n/a

Table 7: Details for FNMR@FMR = 0.0001 and FMR@FNMR = (0.002, 0.005) — Dataset AZLA

Note: “n/a” indicates that the value could not be reliably measured with the available sample size.

	FNMR@FMR = 0.0001	FMR@FNMR = 0.002	FMR@FNMR = 0.005
<i>R Index</i>	0.0301 ±0.00097	n/a	0.4562 ±0.00282
<i>L Index</i>	0.0276 ±0.00093	n/a	0.3015 ±0.00260
<i>R/L Index</i>	0.0149 ±0.00069	0.2182 ±0.00234	0.0160 ±0.00071

Table 8: Details for FNMR@FMR = 0.0001 and FMR@FNMR = (0.002, 0.005) — Dataset DHS2

Note: “n/a” indicates that the value could not be reliably measured with the available sample size.

	FNMR@FMR = 0.0001	FMR@FNMR = 0.002	FMR@FNMR = 0.005
<i>R Index</i>	0.0068 ±0.00046	0.0566 ±0.00131	0.0010 ±0.00017
<i>L Index</i>	0.0175 ±0.00074	0.2704 ±0.00251	0.0426 ±0.00114
<i>R/L Index</i>	0.0010 ±0.00018	n/a	n/a

Table 9: Details for FNMR@FMR = 0.0001 and FMR@FNMR = (0.002, 0.005) — Dataset POEBVA

Note: “n/a” indicates that the value could not be reliably measured with the available sample size.

3 Original PFT Dataset

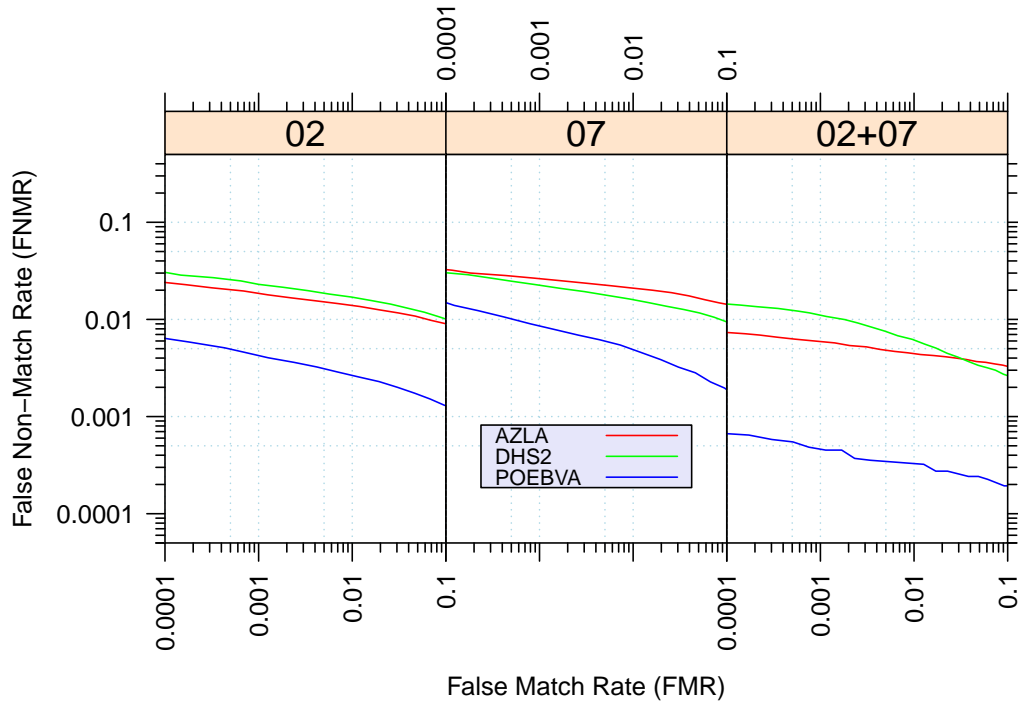


Figure 8: Original PFT Dataset – DET

		EER	FNMR@FMR = 0.0001	FMR@FNMR = 0.005
AZLA	<i>R Index</i>	0.0125	0.0238	0.3564
	<i>L Index</i>	0.0189	0.0326	0.5827
	<i>R/L Index</i>	0.0047	0.0073	0.0039
DHS2	<i>R Index</i>	0.0156	0.0306	0.4393
	<i>L Index</i>	0.0137	0.0297	0.3589
	<i>R/L Index</i>	0.0062	0.0146	0.0173
POEBVA	<i>R Index</i>	0.0032	0.0063	0.0005
	<i>L Index</i>	0.0055	0.0149	0.0096
	<i>R/L Index</i>	0.0005	0.0007	0.0000

Table 10: Details for EER, FNMR@FMR = 0.0001, and FMR@FNMR = 0.005 — Original PFT Dataset