

Participant Results

Proprietary Fingerprint Template Evaluation II (PFT-II)

Participant 3N — Innovatrics

Image Group

Information Access Division

Information Technology Laboratory



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

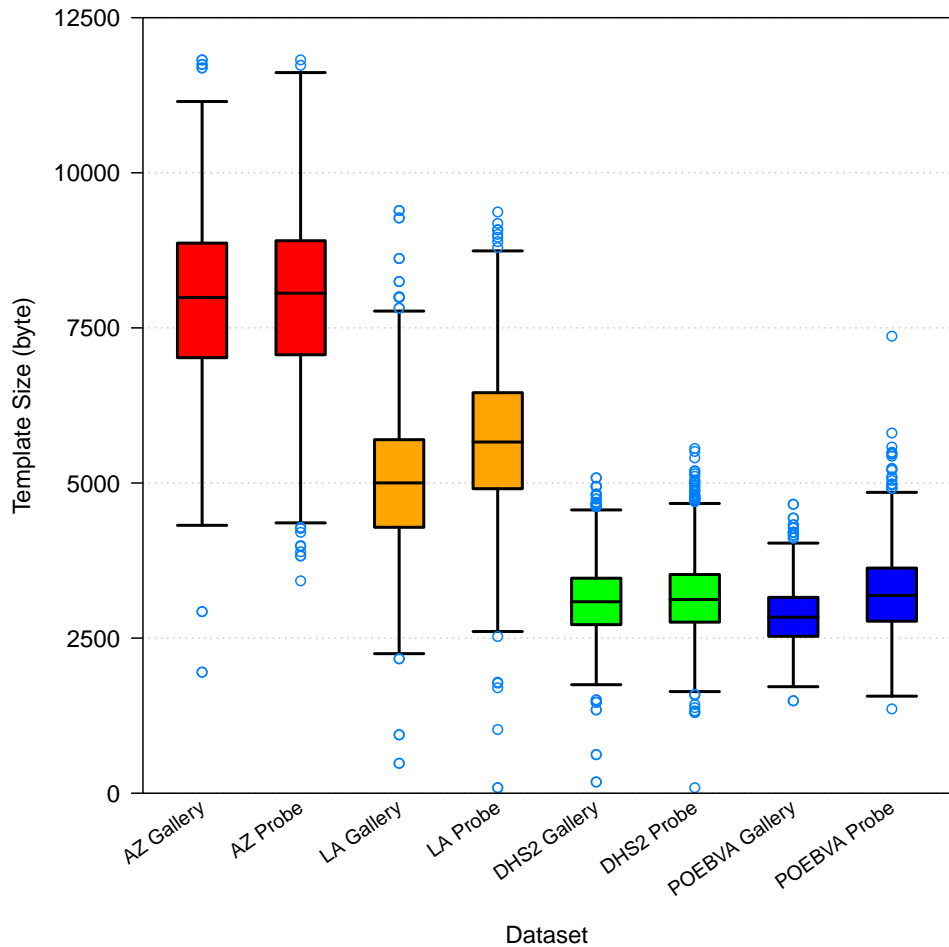


Figure 1: 1K Sample Evaluation – Template Size Distribution

	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>	11819	11820	9392	9369	5082	5555	4656	7366
75%	8866.5	8904.5	5698	6455.5	3465.5	3525	3156.5	3628.5
<i>Median</i>	7988.5	8059	5001.5	5660.5	3086	3122.5	2837	3186.5
25%	7019.5	7066.5	4286	4908	2717	2757	2529	2772.5
<i>Minimum</i>	1951	3423	482	88	181	88	1489	1358

Table 1: Sample Dataset — Template Size Distribution

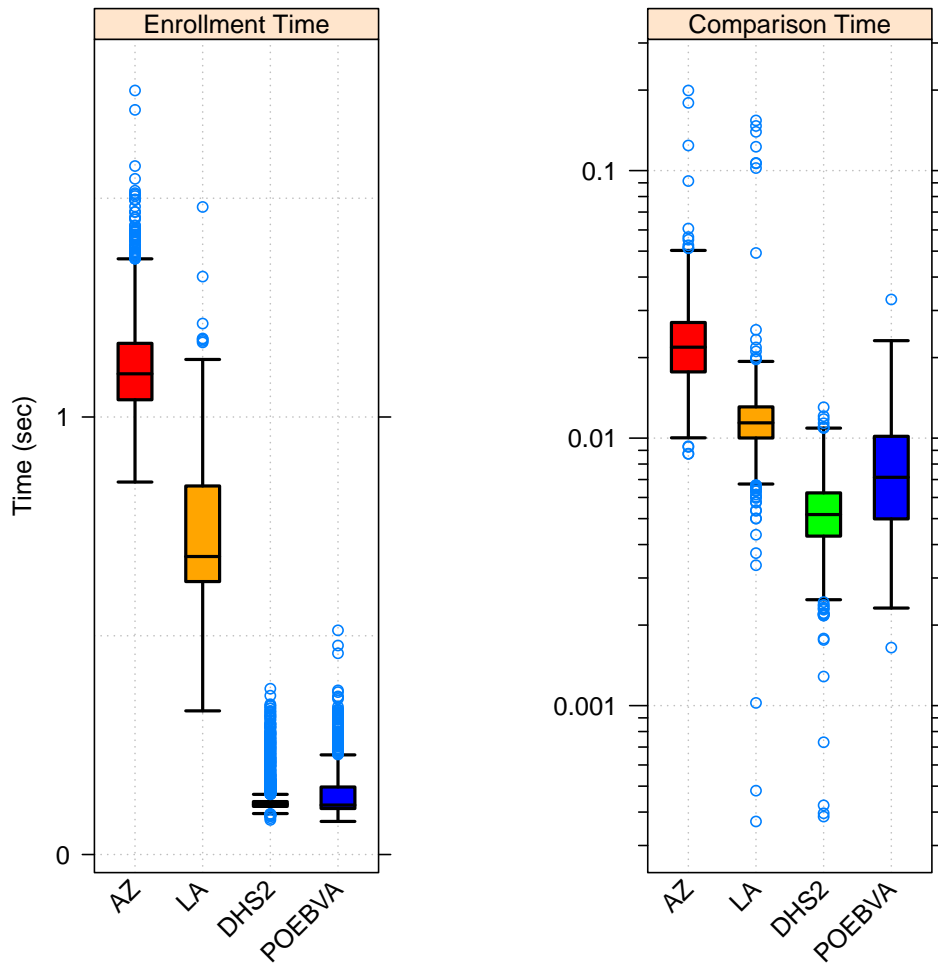


Figure 2: 1K Sample Evaluation – Enrollment and Comparison Timing

	AZ	LA	DHS2	POEBVA
<i>Maximum</i>	1.746	1.480	0.379	0.513
<i>75%</i>	1.168	0.842	0.121	0.154
<i>Median</i>	1.099	0.681	0.115	0.113
<i>25%</i>	1.039	0.624	0.110	0.105
<i>Minimum</i>	0.851	0.328	0.079	0.076

Table 2: Enrollment Times (sec)

	AZ	LA	DHS2	POEBVA
<i>Maximum</i>	0.199	0.154	0.013	0.033
<i>75%</i>	0.027	0.013	0.006	0.010
<i>Median</i>	0.022	0.011	0.005	0.007
<i>25%</i>	0.018	0.010	0.004	0.005
<i>Minimum</i>	0.009	0.000	0.000	0.002

Table 3: Comparison Times (sec)

2 Full Evaluation

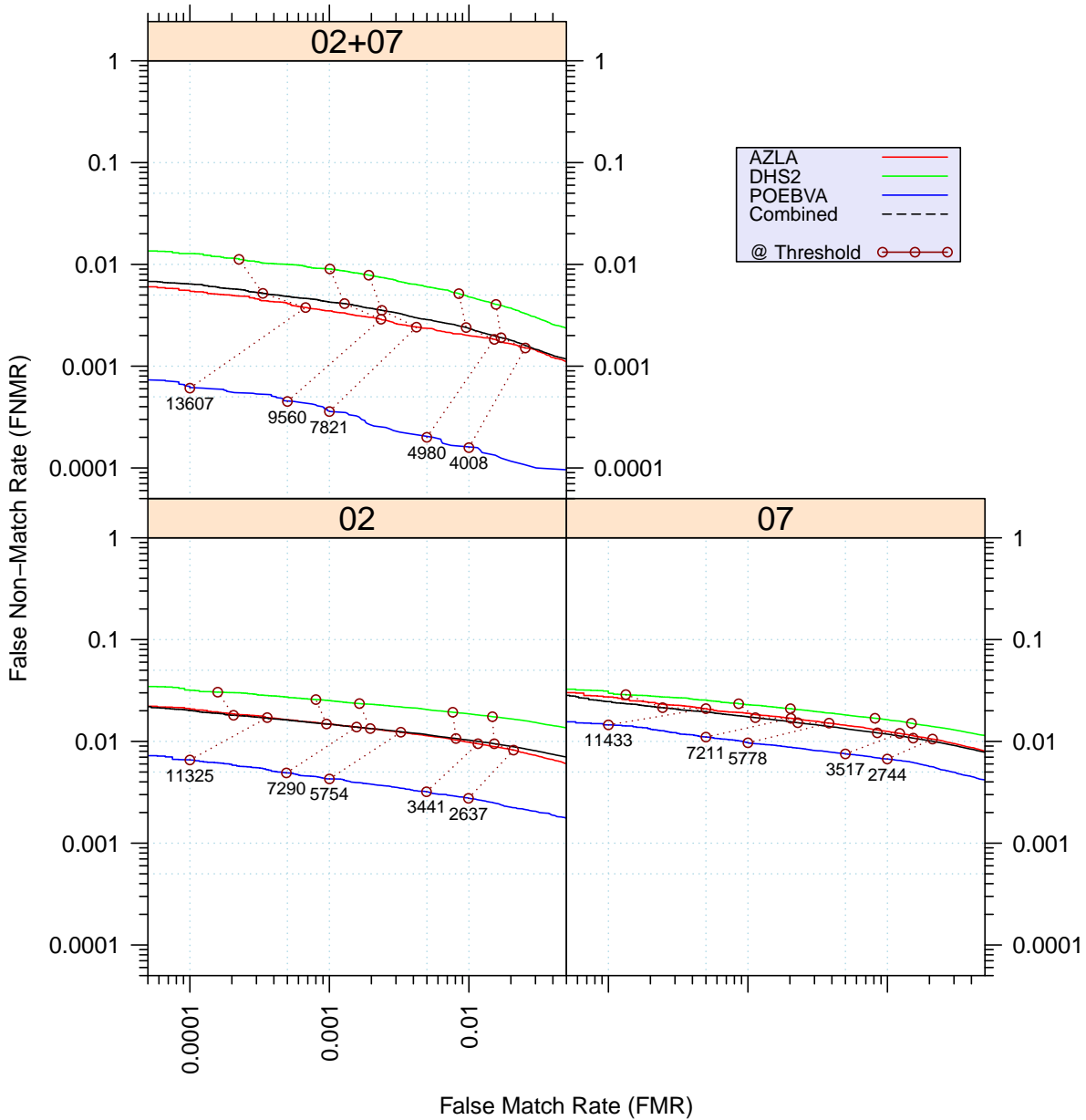


Figure 3: Full Evaluation – DET for POEBVA, DHS2, AZLA, and combined from R Index, L Index, and R/L Index

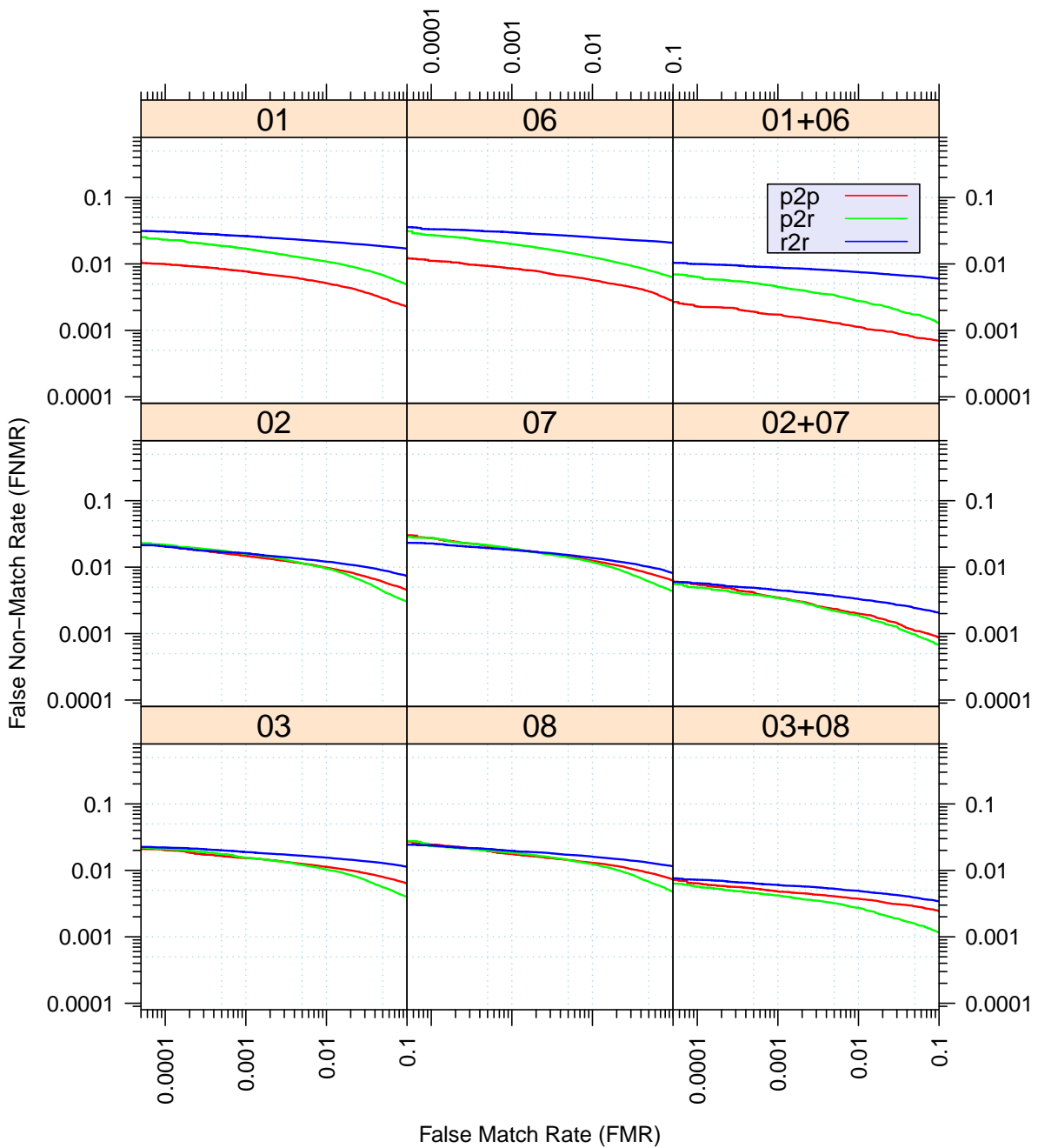


Figure 4: Full Evaluation – DET for all finger positions from AZLA

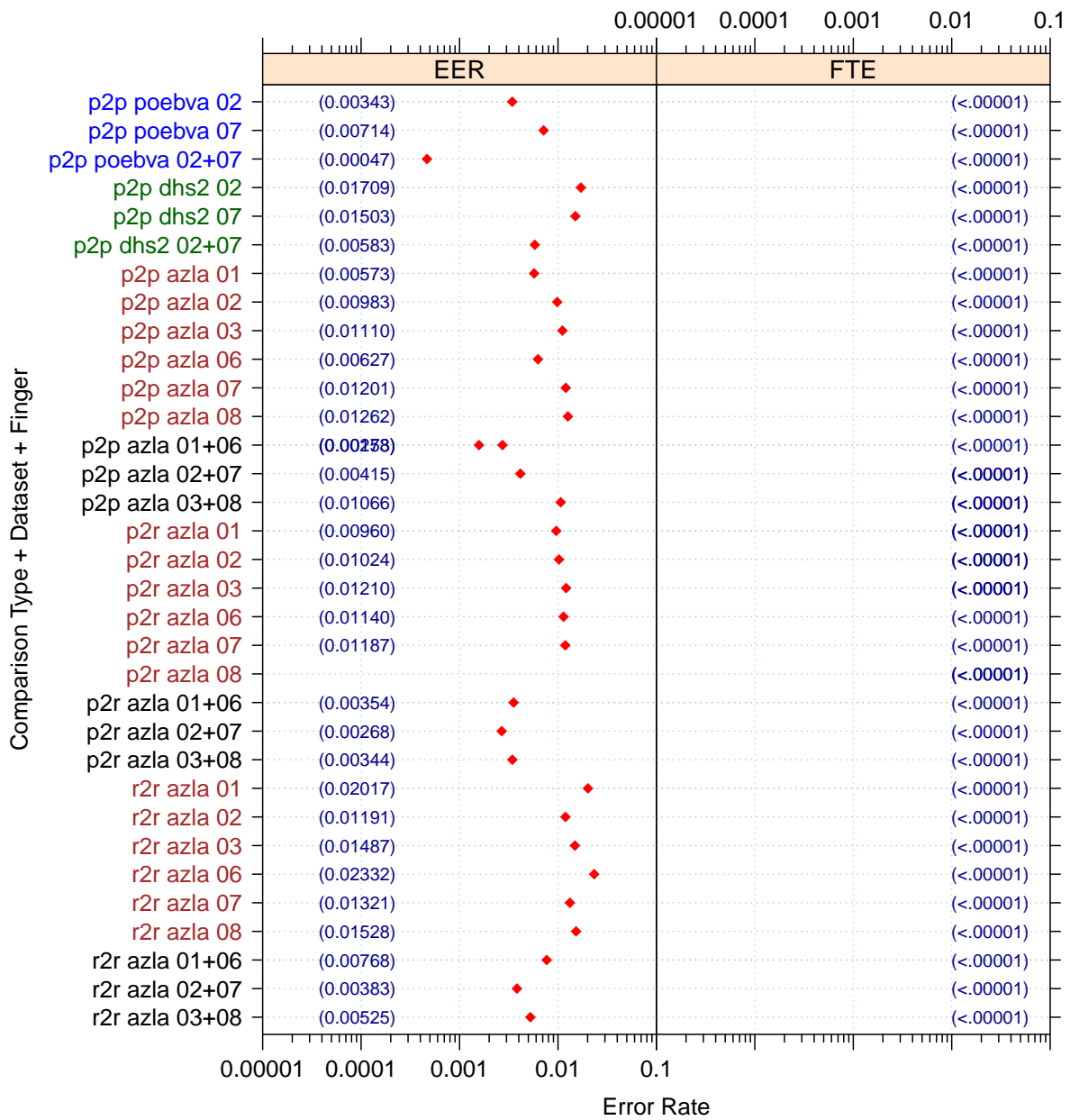


Figure 5: Full Evaluation – EERs and FTEs

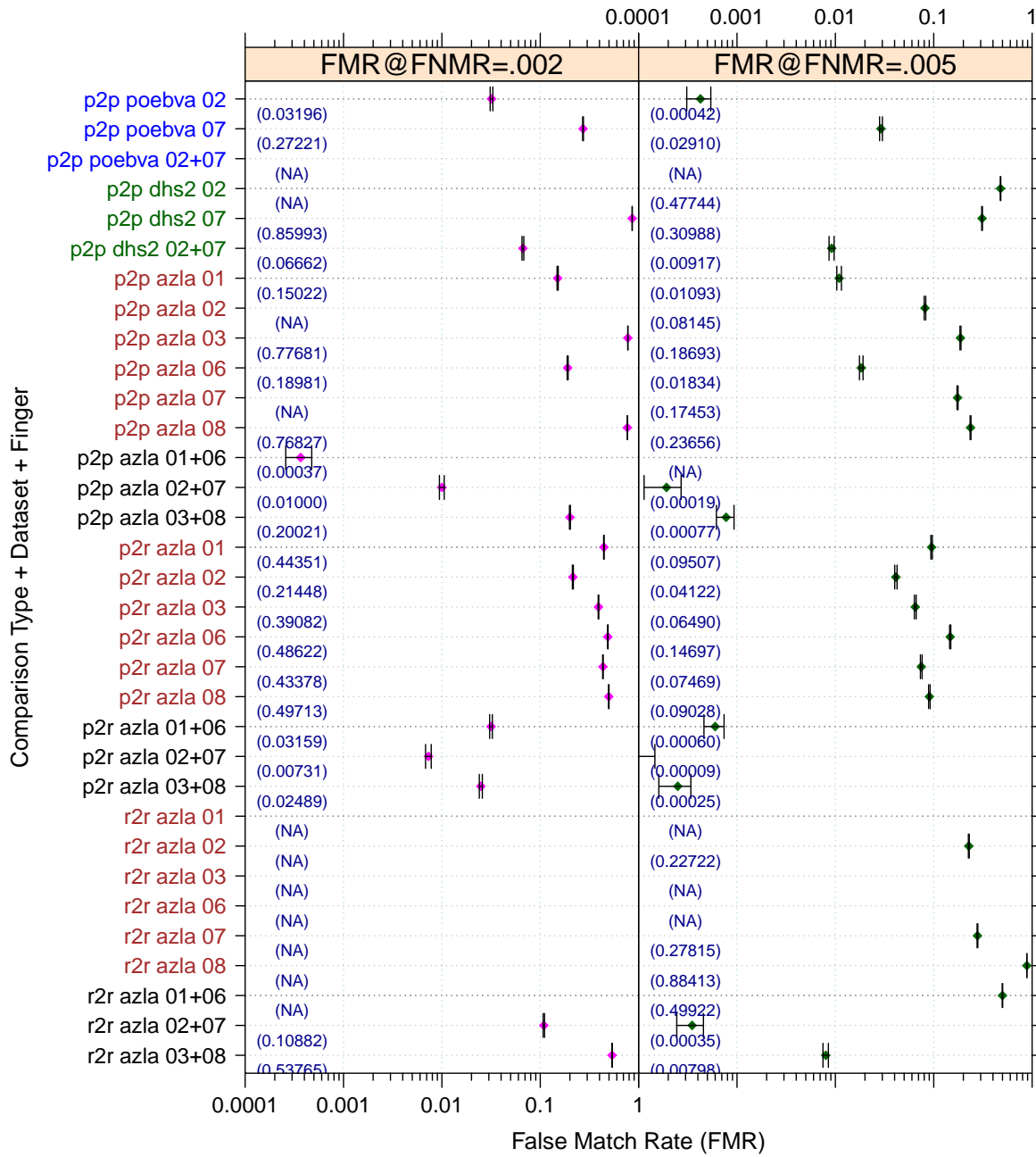


Figure 6: Full Evaluation – FMR@FNMR = (0.002, 0.005) and 95% Confidence Intervals

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

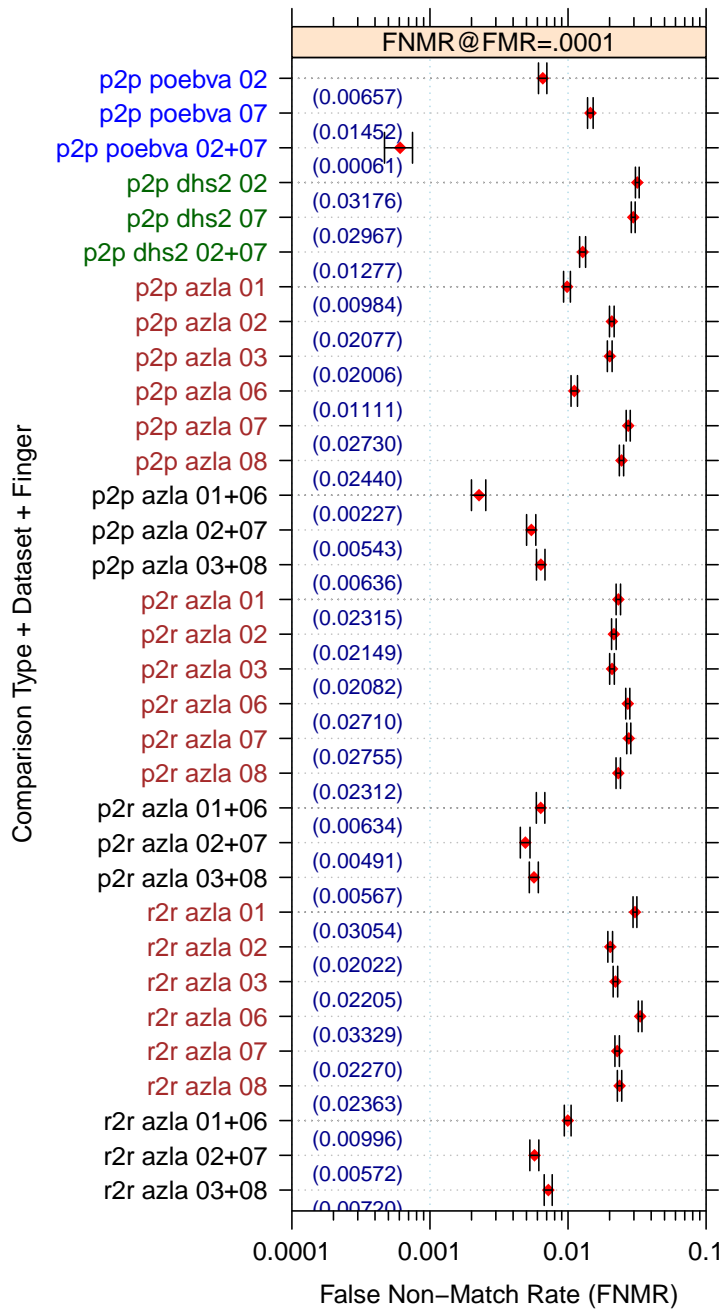


Figure 7: Full Evaluation – FNMR@FMR = 0.0001 and 95% Confidence Intervals

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>	0.0057	0.0000
	<i>R Index</i>	0.0098	0.0000
	<i>R Middle</i>	0.0111	0.0000
	<i>L Thumb</i>	0.0063	0.0000
	<i>L Index</i>	0.0120	0.0000
	<i>L Middle</i>	0.0126	0.0000
	<i>R/L Thumb</i>	0.0016	0.0000
	<i>R/L Index</i>	0.0027	0.0000
	<i>R/L Middle</i>	0.0042	0.0000
Plain to Rolled	<i>R Thumb</i>	0.0107	0.0000
	<i>R Index</i>	0.0096	0.0000
	<i>R Middle</i>	0.0102	0.0000
	<i>L Thumb</i>	0.0121	0.0000
	<i>L Index</i>	0.0114	0.0000
	<i>L Middle</i>	0.0119	0.0000
	<i>R/L Thumb</i>	0.0035	0.0000
	<i>R/L Index</i>	0.0027	0.0000
	<i>R/L Middle</i>	0.0034	0.0000
Rolled to Rolled	<i>R Thumb</i>	0.0202	0.0000
	<i>R Index</i>	0.0119	0.0000
	<i>R Middle</i>	0.0149	0.0000
	<i>L Thumb</i>	0.0233	0.0000
	<i>L Index</i>	0.0132	0.0000
	<i>L Middle</i>	0.0153	0.0000
	<i>R/L Thumb</i>	0.0077	0.0000
	<i>R/L Index</i>	0.0038	0.0000
	<i>R/L Middle</i>	0.0053	0.0000

Table 4: EER and FTE — Dataset AZLA

		EER	FTE Rate
<i>R Index</i>	0.0171	0.0000	
<i>L Index</i>	0.0150	0.0000	
<i>R/L Index</i>	0.0058	0.0000	

Table 5: EER and FTE — Dataset DHS2

		EER	FTE Rate
<i>R Index</i>	0.0034	0.0000	
<i>L Index</i>	0.0071	0.0000	
<i>R/L Index</i>	0.0005	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>	0.0098 ±0.00056	0.1502 ±0.00202	0.0109 ±0.00059
	<i>R Index</i>	0.0208 ±0.00081	n/a	0.0814 ±0.00155
	<i>R Middle</i>	0.0201 ±0.00079	0.7768 ±0.00236	0.1869 ±0.00221
	<i>L Thumb</i>	0.0111 ±0.00059	0.1898 ±0.00222	0.0183 ±0.00076
	<i>L Index</i>	0.0273 ±0.00092	n/a	0.1745 ±0.00215
	<i>L Middle</i>	0.0244 ±0.00087	0.7683 ±0.00239	0.2366 ±0.00240
	<i>R/L Thumb</i>	0.0023 ±0.00027	0.0004 ±0.00011	n/a
	<i>R/L Index</i>	0.0054 ±0.00042	0.0100 ±0.00056	0.0002 ±0.00008
	<i>R/L Middle</i>	0.0064 ±0.00045	0.2002 ±0.00226	0.0008 ±0.00016
Plain to Rolled	<i>R Thumb</i>	0.0232 ±0.00085	0.4435 ±0.00281	0.0951 ±0.00166
	<i>R Index</i>	0.0215 ±0.00082	0.2145 ±0.00232	0.0412 ±0.00112
	<i>R Middle</i>	0.0208 ±0.00081	0.3908 ±0.00276	0.0649 ±0.00139
	<i>L Thumb</i>	0.0271 ±0.00092	0.4862 ±0.00283	0.1470 ±0.00200
	<i>L Index</i>	0.0276 ±0.00093	0.4338 ±0.00280	0.0747 ±0.00149
	<i>L Middle</i>	0.0231 ±0.00085	0.4971 ±0.00283	0.0903 ±0.00162
	<i>R/L Thumb</i>	0.0063 ±0.00045	0.0316 ±0.00099	0.0006 ±0.00014
	<i>R/L Index</i>	0.0049 ±0.00040	0.0073 ±0.00048	0.0001 ±0.00005
	<i>R/L Middle</i>	0.0057 ±0.00042	0.0249 ±0.00088	0.0003 ±0.00009
Rolled to Rolled	<i>R Thumb</i>	0.0305 ±0.00097	n/a	n/a
	<i>R Index</i>	0.0202 ±0.00080	n/a	0.2272 ±0.00237
	<i>R Middle</i>	0.0221 ±0.00083	n/a	n/a
	<i>L Thumb</i>	0.0333 ±0.00102	n/a	n/a
	<i>L Index</i>	0.0227 ±0.00084	n/a	0.2782 ±0.00253
	<i>L Middle</i>	0.0236 ±0.00086	n/a	0.8841 ±0.00181
	<i>R/L Thumb</i>	0.0100 ±0.00056	n/a	0.4992 ±0.00283
	<i>R/L Index</i>	0.0057 ±0.00043	0.1088 ±0.00176	0.0003 ±0.00011
	<i>R/L Middle</i>	0.0072 ±0.00048	0.5376 ±0.00282	0.0080 ±0.00050

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>	0.0318 ±0.00099	n/a	0.4774 ±0.00283
<i>L Index</i>	0.0297 ±0.00096	0.8599 ±0.00196	0.3099 ±0.00262
<i>R/L Index</i>	0.0128 ±0.00064	0.0666 ±0.00141	0.0092 ±0.00054

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>	0.0066 ±0.00046	0.0320 ±0.00100	0.0004 ±0.00012
<i>L Index</i>	0.0145 ±0.00068	0.2722 ±0.00252	0.0291 ±0.00095
<i>R/L Index</i>	0.0006 ±0.00014	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

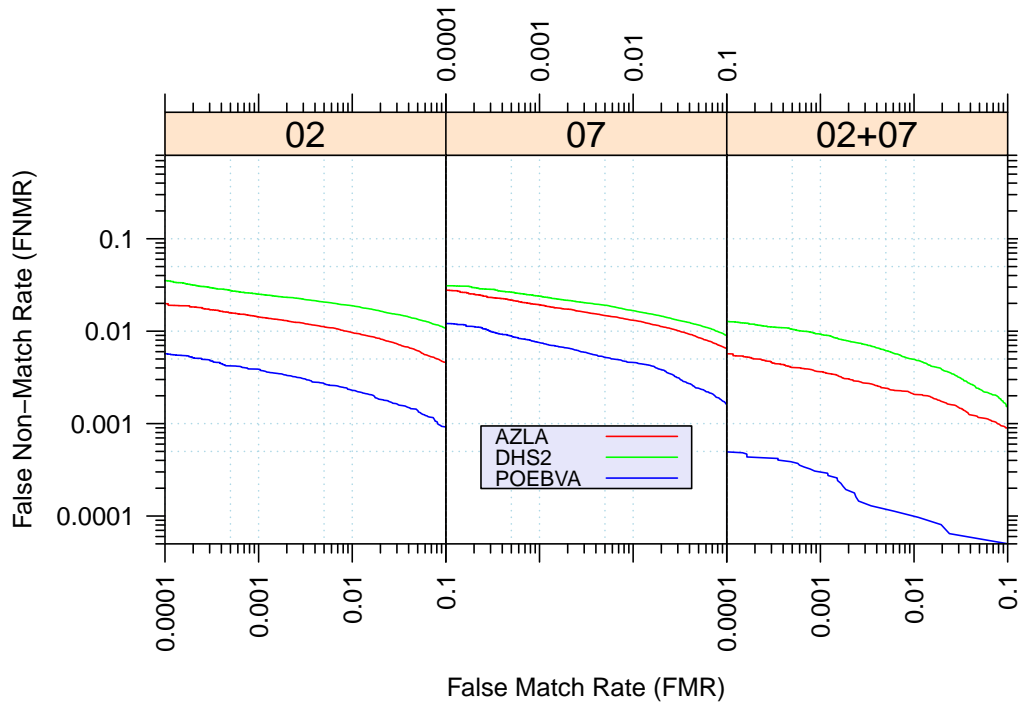


Figure 8: Original PFT Dataset – DET

		EER	FNMR@FMR = 0.0001	FMR@FNMR = 0.005
AZLA	<i>R Index</i>	0.0097	0.0198	0.0810
	<i>L Index</i>	0.0126	0.0277	0.1923
	<i>R/L Index</i>	0.0028	0.0057	0.0002
DHS2	<i>R Index</i>	0.0170	0.0351	0.4687
	<i>L Index</i>	0.0154	0.0310	0.3121
	<i>R/L Index</i>	0.0059	0.0127	0.0093
POEBVA	<i>R Index</i>	0.0030	0.0057	0.0002
	<i>L Index</i>	0.0052	0.0121	0.0059
	<i>R/L Index</i>	0.0004	0.0005	n/a

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

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