

# Participant Results

Proprietary Fingerprint Template Evaluation II (PFT-II)

Participant 3Z — Neurotechnology

Image Group

Information Access Division

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# 1 1K Sample Evaluation

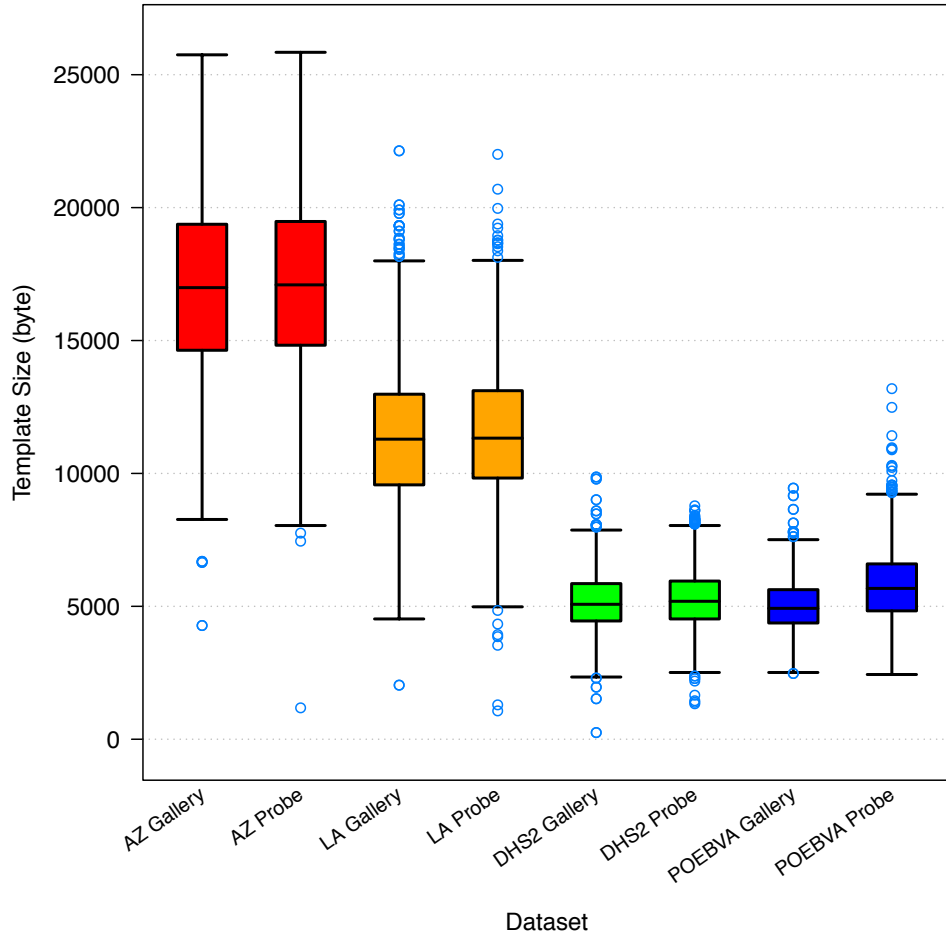


Figure 1: 1K Sample Evaluation – Template Size Distribution

|                   | 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>    | 25748   | 25843   | 22138    | 22005   | 9864    | 8781    | 9446    | 13189   |
| 75%               | 19373.5 | 19478   | 12980    | 13113   | 5855    | 5950    | 5627    | 6596    |
| <i>Median</i>     | 16989   | 17093.5 | 11289    | 11327   | 5076    | 5190    | 4924    | 5674.5  |
| 25%               | 14633   | 14823   | 9569.5   | 9826    | 4449    | 4525    | 4373    | 4829    |
| <i>Minimum</i>    | 4278    | 1181    | 2036     | 1067    | 250     | 1333    | 2473    | 2435    |

Table 1: Sample Dataset — Template Size Distribution

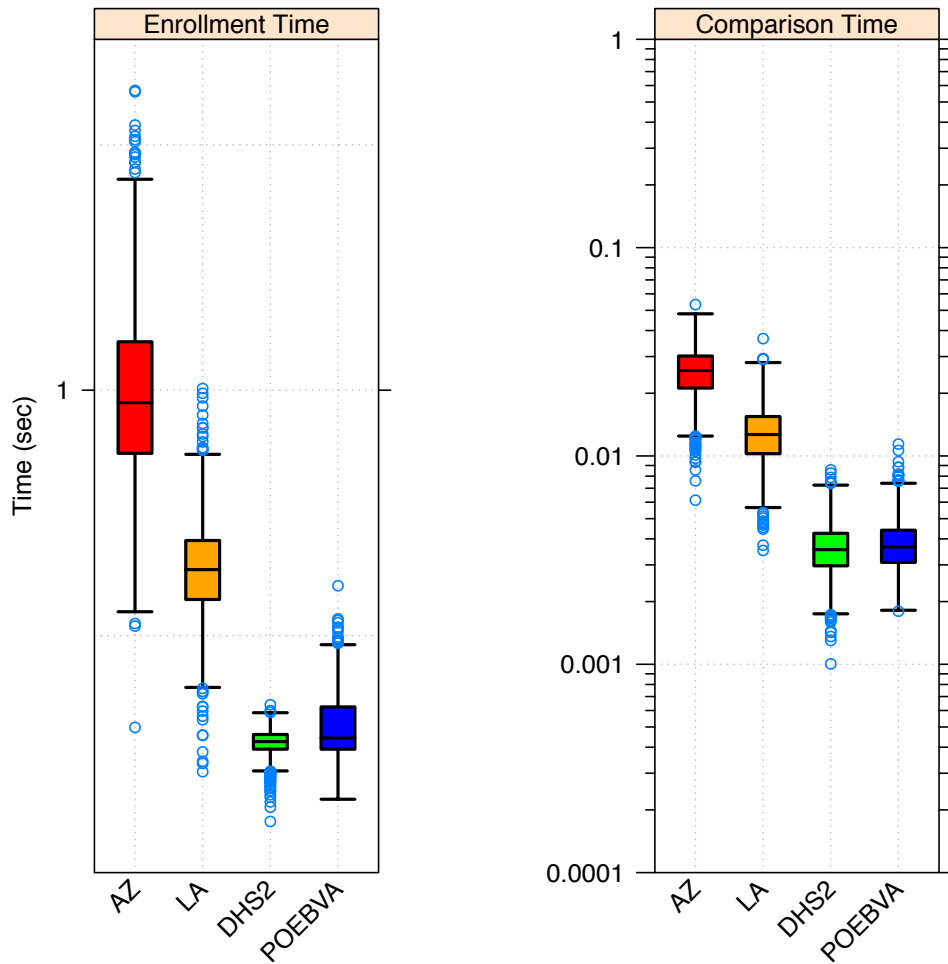


Figure 2: 1K Sample Evaluation – Enrollment and Comparison Timing

|                | AZ    | LA    | DHS2  | POEBVA |
|----------------|-------|-------|-------|--------|
| <i>Maximum</i> | 1.611 | 1.003 | 0.359 | 0.602  |
| <i>75%</i>     | 1.099 | 0.694 | 0.298 | 0.355  |
| <i>Median</i>  | 0.975 | 0.634 | 0.284 | 0.291  |
| <i>25%</i>     | 0.871 | 0.573 | 0.268 | 0.268  |
| <i>Minimum</i> | 0.313 | 0.223 | 0.121 | 0.166  |

Table 2: Enrollment Times (sec)

|                | AZ    | LA    | DHS2  | POEBVA |
|----------------|-------|-------|-------|--------|
| <i>Maximum</i> | 0.053 | 0.037 | 0.009 | 0.011  |
| <i>75%</i>     | 0.030 | 0.015 | 0.004 | 0.004  |
| <i>Median</i>  | 0.026 | 0.013 | 0.004 | 0.004  |
| <i>25%</i>     | 0.021 | 0.010 | 0.003 | 0.003  |
| <i>Minimum</i> | 0.006 | 0.004 | 0.001 | 0.002  |

Table 3: Comparison Times (sec)

## 2 Full Evaluation

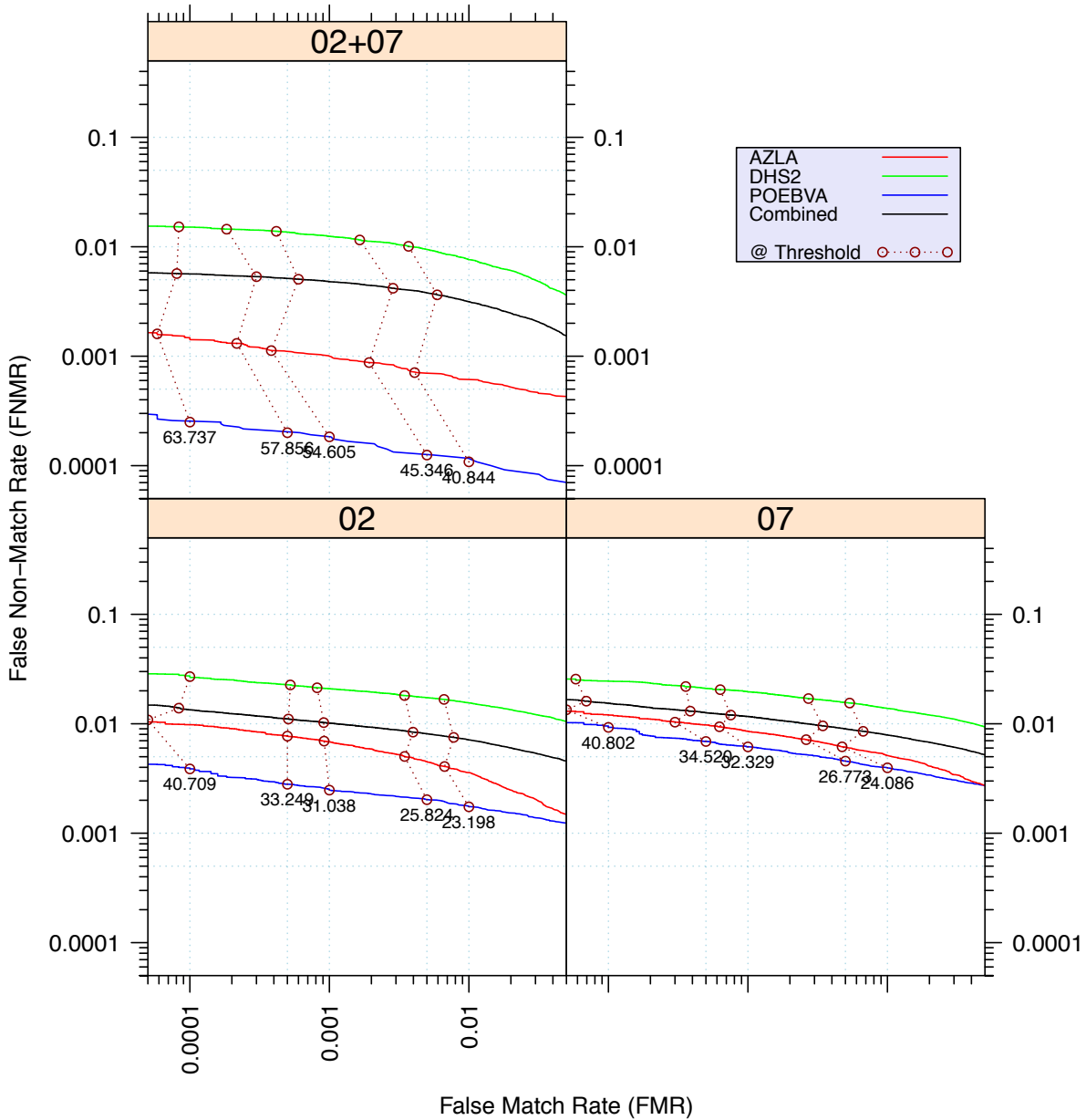


Figure 3: Full Evaluation – DET for POEBVA, DHS2, AZLA, and combined from R Index, L Index, and R/L Index

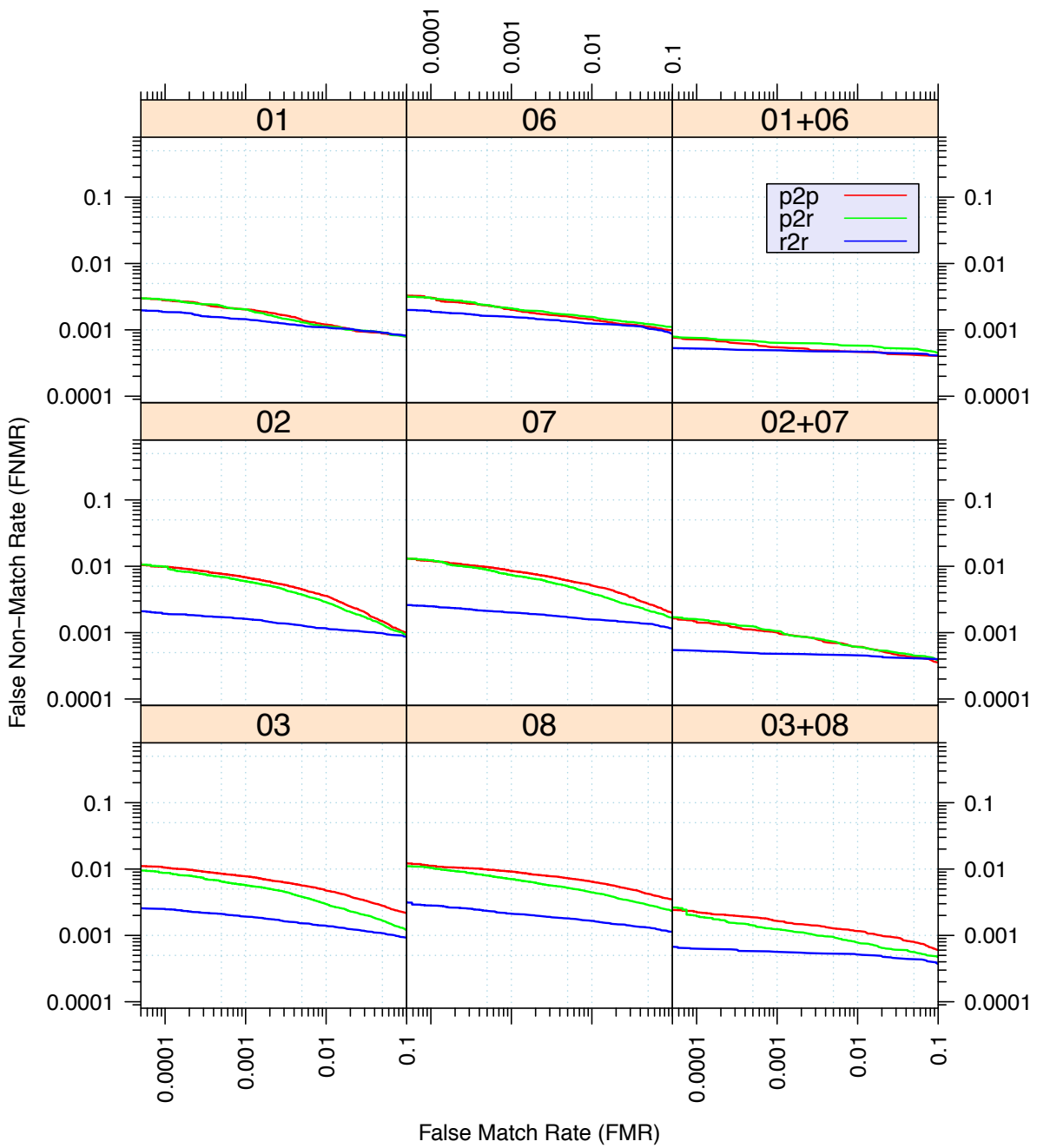


Figure 4: Full Evaluation – DET for all finger positions from AZLA

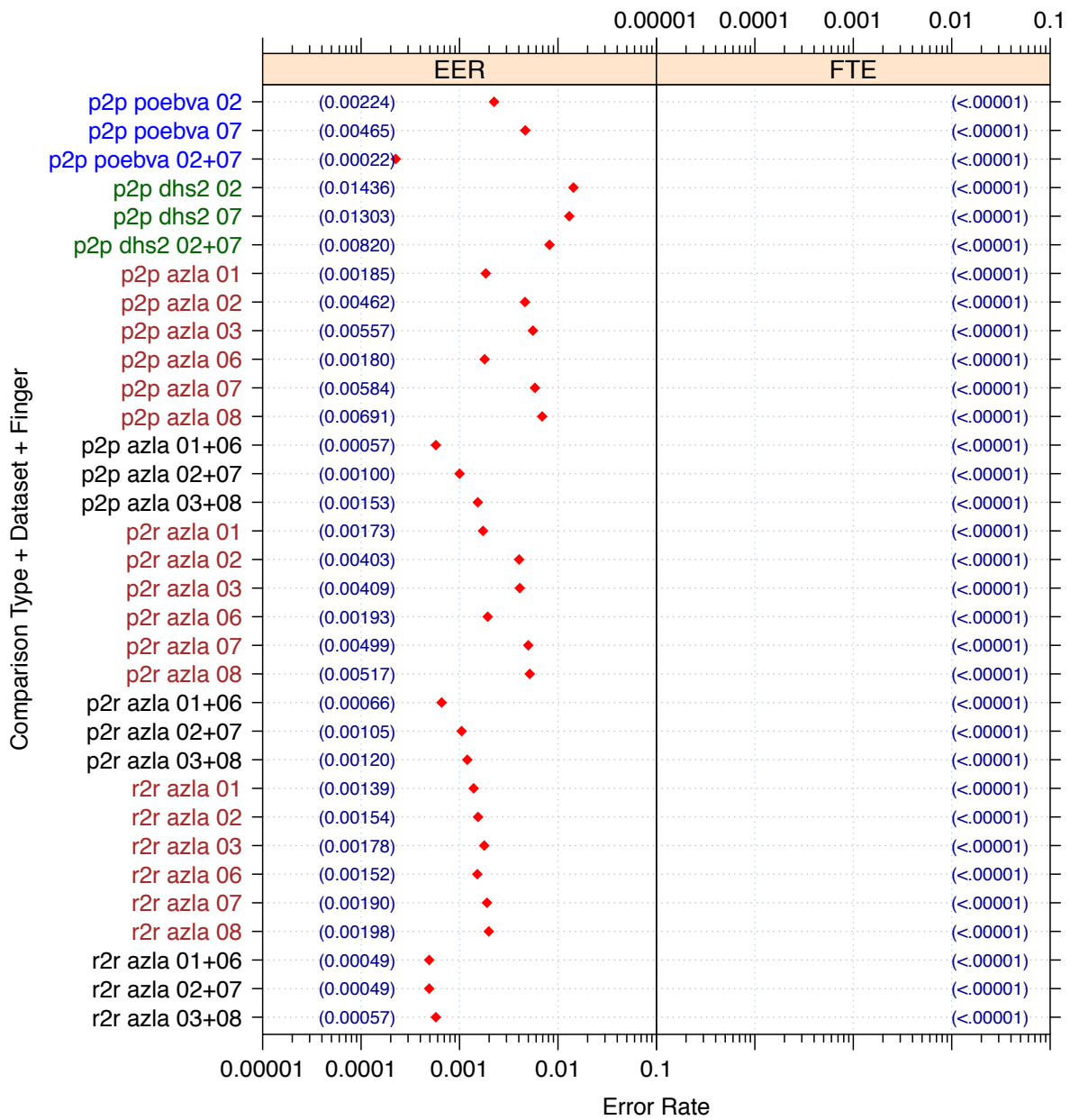


Figure 5: Full Evaluation – EERs and FTEs

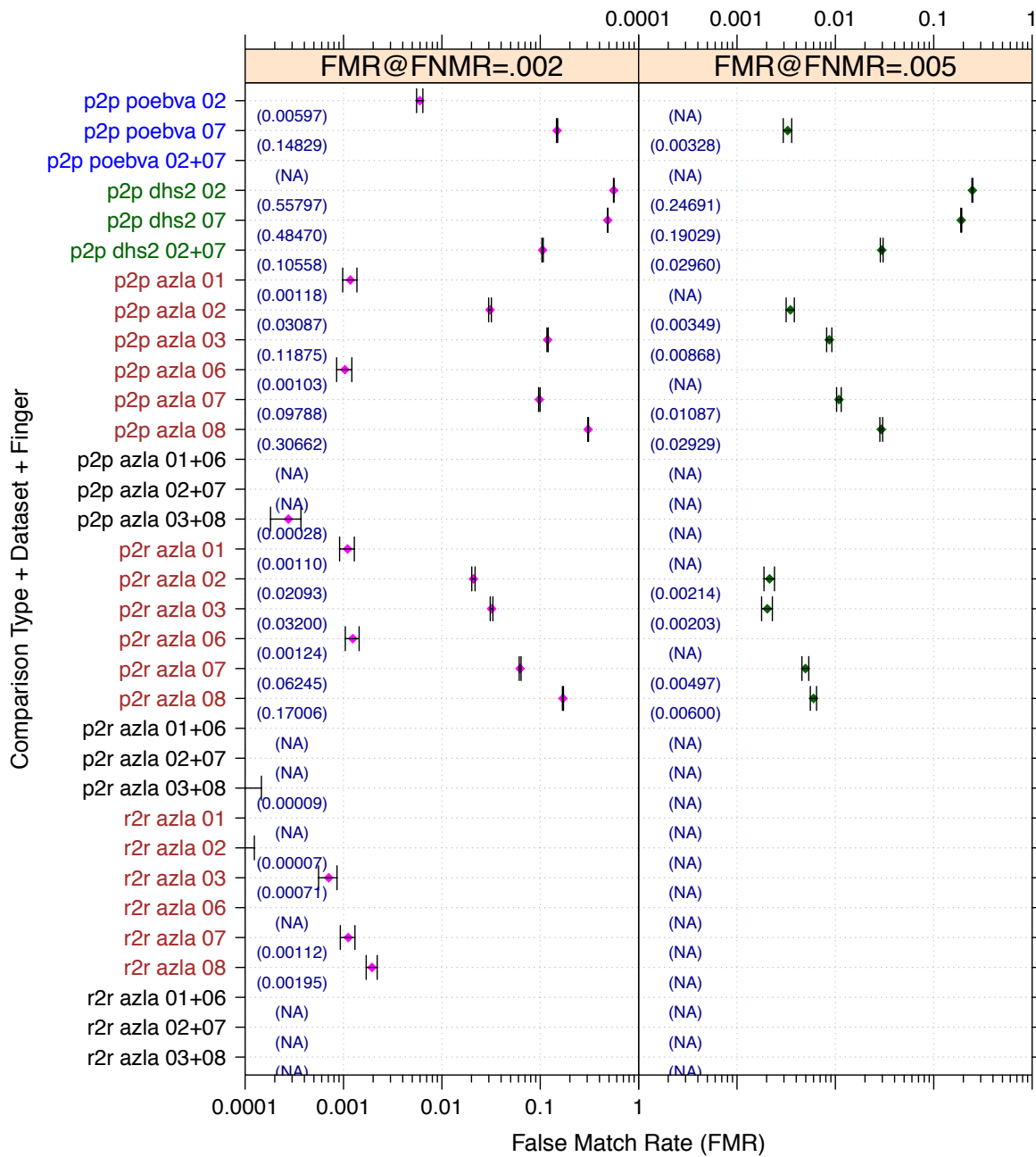


Figure 6: Full Evaluation – FMR@FNMR = (0.002, 0.005) and 95% Confidence Intervals

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



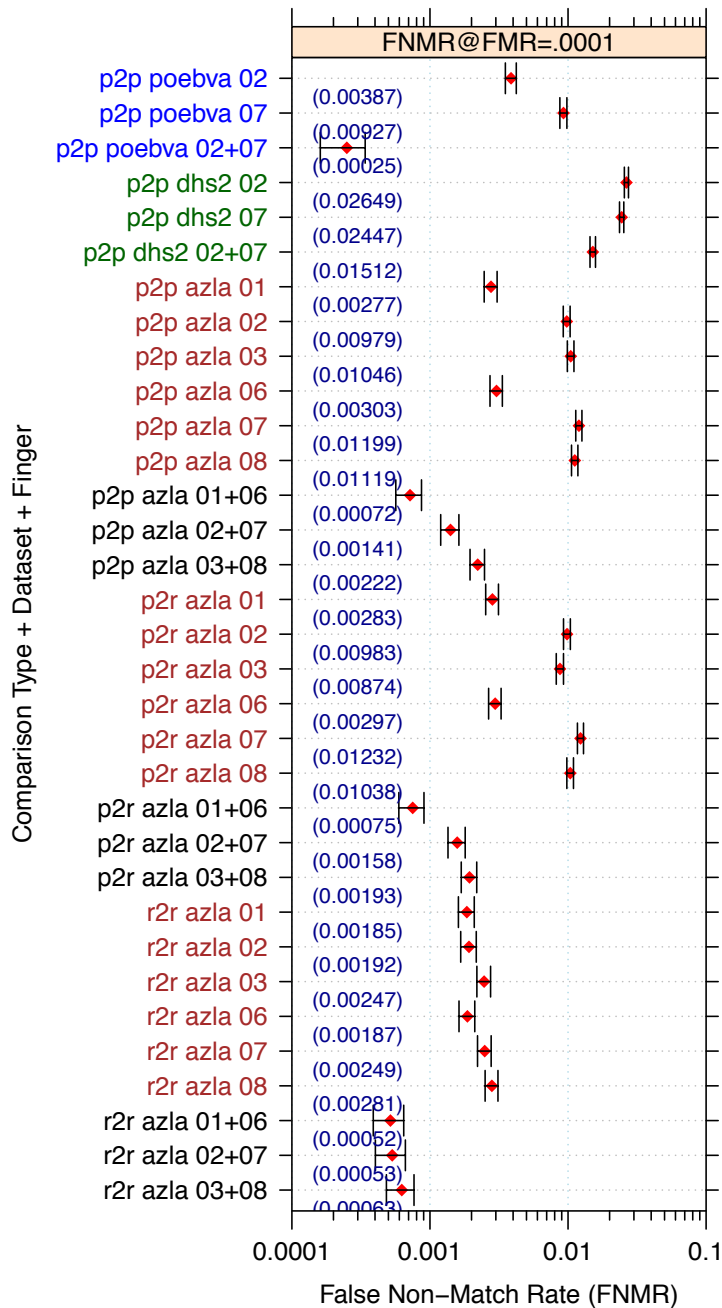


Figure 7: Full Evaluation – FNMR@FMR = 0.0001 and 95% Confidence Intervals

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

|                         |                   | <b>EER</b> | <b>FTE Rate</b> |
|-------------------------|-------------------|------------|-----------------|
| <b>Plain to Plain</b>   | <i>R Thumb</i>    | 0.0019     | 0.0000          |
|                         | <i>R Index</i>    | 0.0046     | 0.0000          |
|                         | <i>R Middle</i>   | 0.0056     | 0.0000          |
|                         | <i>L Thumb</i>    | 0.0018     | 0.0000          |
|                         | <i>L Index</i>    | 0.0058     | 0.0000          |
|                         | <i>L Middle</i>   | 0.0069     | 0.0000          |
|                         | <i>R/L Thumb</i>  | 0.0006     | 0.0000          |
|                         | <i>R/L Index</i>  | 0.0010     | 0.0000          |
|                         | <i>R/L Middle</i> | 0.0015     | 0.0000          |
| <b>Plain to Rolled</b>  | <i>R Thumb</i>    | 0.0017     | 0.0000          |
|                         | <i>R Index</i>    | 0.0040     | 0.0000          |
|                         | <i>R Middle</i>   | 0.0041     | 0.0000          |
|                         | <i>L Thumb</i>    | 0.0019     | 0.0000          |
|                         | <i>L Index</i>    | 0.0050     | 0.0000          |
|                         | <i>L Middle</i>   | 0.0052     | 0.0000          |
|                         | <i>R/L Thumb</i>  | 0.0007     | 0.0000          |
|                         | <i>R/L Index</i>  | 0.0010     | 0.0000          |
|                         | <i>R/L Middle</i> | 0.0012     | 0.0000          |
| <b>Rolled to Rolled</b> | <i>R Thumb</i>    | 0.0014     | 0.0000          |
|                         | <i>R Index</i>    | 0.0015     | 0.0000          |
|                         | <i>R Middle</i>   | 0.0018     | 0.0000          |
|                         | <i>L Thumb</i>    | 0.0015     | 0.0000          |
|                         | <i>L Index</i>    | 0.0019     | 0.0000          |
|                         | <i>L Middle</i>   | 0.0020     | 0.0000          |
|                         | <i>R/L Thumb</i>  | 0.0005     | 0.0000          |
|                         | <i>R/L Index</i>  | 0.0005     | 0.0000          |
|                         | <i>R/L Middle</i> | 0.0006     | 0.0000          |

Table 4: EER and FTE — Dataset AZLA

|                  |        | <b>EER</b> | <b>FTE Rate</b> |
|------------------|--------|------------|-----------------|
| <i>R Index</i>   | 0.0144 | 0.0000     |                 |
| <i>L Index</i>   | 0.0130 | 0.0000     |                 |
| <i>R/L Index</i> | 0.0082 | 0.0000     |                 |

Table 5: EER and FTE — Dataset DHS2

|                  |        | <b>EER</b> | <b>FTE Rate</b> |
|------------------|--------|------------|-----------------|
| <i>R Index</i>   | 0.0022 | 0.0000     |                 |
| <i>L Index</i>   | 0.0046 | 0.0000     |                 |
| <i>R/L Index</i> | 0.0002 | 0.0000     |                 |

Table 6: EER and FTE — Dataset POEBVA

|                         |                   | <b>FNMR@FMR = 0.0001</b> | <b>FMR@FNMR = 0.002</b> | <b>FMR@FNMR = 0.005</b> |
|-------------------------|-------------------|--------------------------|-------------------------|-------------------------|
| <b>Plain to Plain</b>   | <i>R Thumb</i>    | 0.0028 ±0.00030          | 0.0012 ±0.00019         | n/a                     |
|                         | <i>R Index</i>    | 0.0098 ±0.00056          | 0.0309 ±0.00098         | 0.0035 ±0.00033         |
|                         | <i>R Middle</i>   | 0.0105 ±0.00058          | 0.1187 ±0.00183         | 0.0087 ±0.00052         |
|                         | <i>L Thumb</i>    | 0.0030 ±0.00031          | 0.0010 ±0.00018         | n/a                     |
|                         | <i>L Index</i>    | 0.0120 ±0.00062          | 0.0979 ±0.00168         | 0.0109 ±0.00059         |
|                         | <i>L Middle</i>   | 0.0112 ±0.00060          | 0.3066 ±0.00261         | 0.0293 ±0.00095         |
|                         | <i>R/L Thumb</i>  | 0.0007 ±0.00015          | n/a                     | n/a                     |
|                         | <i>R/L Index</i>  | 0.0014 ±0.00021          | n/a                     | n/a                     |
|                         | <i>R/L Middle</i> | 0.0022 ±0.00027          | 0.0003 ±0.00009         | n/a                     |
| <b>Plain to Rolled</b>  | <i>R Thumb</i>    | 0.0028 ±0.00030          | 0.0011 ±0.00019         | n/a                     |
|                         | <i>R Index</i>    | 0.0098 ±0.00056          | 0.0209 ±0.00081         | 0.0021 ±0.00026         |
|                         | <i>R Middle</i>   | 0.0087 ±0.00053          | 0.0320 ±0.00100         | 0.0020 ±0.00026         |
|                         | <i>L Thumb</i>    | 0.0030 ±0.00031          | 0.0012 ±0.00020         | n/a                     |
|                         | <i>L Index</i>    | 0.0123 ±0.00062          | 0.0624 ±0.00137         | 0.0050 ±0.00040         |
|                         | <i>L Middle</i>   | 0.0104 ±0.00057          | 0.1701 ±0.00213         | 0.0060 ±0.00044         |
|                         | <i>R/L Thumb</i>  | 0.0008 ±0.00015          | n/a                     | n/a                     |
|                         | <i>R/L Index</i>  | 0.0016 ±0.00022          | n/a                     | n/a                     |
|                         | <i>R/L Middle</i> | 0.0019 ±0.00025          | 0.0001 ±0.00005         | n/a                     |
| <b>Rolled to Rolled</b> | <i>R Thumb</i>    | 0.0019 ±0.00024          | n/a                     | n/a                     |
|                         | <i>R Index</i>    | 0.0019 ±0.00025          | n/a                     | n/a                     |
|                         | <i>R Middle</i>   | 0.0025 ±0.00028          | 0.0007 ±0.00015         | n/a                     |
|                         | <i>L Thumb</i>    | 0.0019 ±0.00024          | n/a                     | n/a                     |
|                         | <i>L Index</i>    | 0.0025 ±0.00028          | 0.0011 ±0.00019         | n/a                     |
|                         | <i>L Middle</i>   | 0.0028 ±0.00030          | 0.0019 ±0.00025         | n/a                     |
|                         | <i>R/L Thumb</i>  | 0.0005 ±0.00013          | n/a                     | n/a                     |
|                         | <i>R/L Index</i>  | 0.0005 ±0.00013          | n/a                     | n/a                     |
|                         | <i>R/L Middle</i> | 0.0006 ±0.00014          | n/a                     | 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.

|                  | <b>FNMR@FMR = 0.0001</b> | <b>FMR@FNMR = 0.002</b> | <b>FMR@FNMR = 0.005</b> |
|------------------|--------------------------|-------------------------|-------------------------|
| <i>R Index</i>   | 0.0265 ±0.00091          | 0.5580 ±0.00281         | 0.2469 ±0.00244         |
| <i>L Index</i>   | 0.0245 ±0.00087          | 0.4847 ±0.00283         | 0.1903 ±0.00222         |
| <i>R/L Index</i> | 0.0151 ±0.00069          | 0.1056 ±0.00174         | 0.0296 ±0.00096         |

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

|                  | <b>FNMR@FMR = 0.0001</b> | <b>FMR@FNMR = 0.002</b> | <b>FMR@FNMR = 0.005</b> |
|------------------|--------------------------|-------------------------|-------------------------|
| <i>R Index</i>   | 0.0039 ±0.00035          | 0.0060 ±0.00044         | n/a                     |
| <i>L Index</i>   | 0.0093 ±0.00054          | 0.1483 ±0.00201         | 0.0033 ±0.00032         |
| <i>R/L Index</i> | 0.0003 ±0.00009          | 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

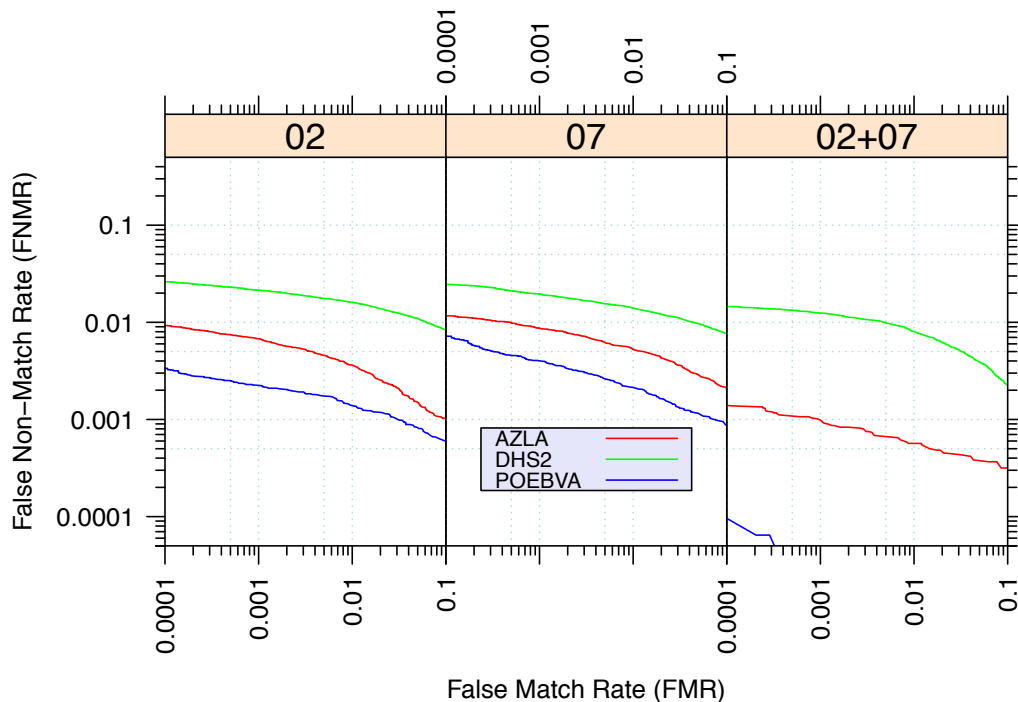


Figure 8: Original PFT Dataset – DET

|               |                  | EER    | FNMR@FMR = 0.0001 | FMR@FNMR = 0.005 |
|---------------|------------------|--------|-------------------|------------------|
| <b>AZLA</b>   | <i>R Index</i>   | 0.0046 | 0.0093            | 0.0037           |
|               | <i>L Index</i>   | 0.0059 | 0.0116            | 0.0125           |
|               | <i>R/L Index</i> | 0.0010 | 0.0014            | n/a              |
| <b>DHS2</b>   | <i>R Index</i>   | 0.0149 | 0.0261            | 0.2467           |
|               | <i>L Index</i>   | 0.0132 | 0.0246            | 0.2105           |
|               | <i>R/L Index</i> | 0.0086 | 0.0145            | 0.0319           |
| <b>POEBVA</b> | <i>R Index</i>   | n/a    | 0.0033            | n/a              |
|               | <i>L Index</i>   | 0.0030 | 0.0072            | 0.0003           |
|               | <i>R/L Index</i> | 0.0001 | n/a               | 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.