

S2: Subject Specific Results on the Akimpech Dataset
Supplementary Material for
A Bayesian Model for Exploiting Application Constraints to
Enable Unsupervised Training of a P300 based BCI

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Table 1: Akimpech Spelling Accuracies using 5 repetitions

| | OFF-US | OFF-US-T | ON-US-T | OA-US-T | RE-OA-US-T | OA-US |
|-----|--------------|--------------|--------------|--------------|--------------|-------------|
| ACS | 78.4 (1.66) | 77.9 (2.22) | 78.9 (0.00) | 78.9 (0.00) | 78.9 (0.00) | 59.5 (3.55) |
| ASG | 90.5 (0.00) | 90.5 (0.00) | 90.5 (0.00) | 90.5 (0.00) | 90.5 (0.00) | 76.2 (0.00) |
| ASR | 96.2 (0.00) | 96.2 (0.00) | 96.2 (0.00) | 96.2 (0.00) | 96.2 (0.00) | 93.5 (1.86) |
| CLL | 88.5 (0.00) | 80.8 (0.00) | 84.6 (0.00) | 76.9 (0.00) | 80.8 (0.00) | 23.1 (0.00) |
| DCM | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 85.9 (1.09) |
| DLP | 69.6 (0.00) | 78.3 (0.00) | 73.9 (0.00) | 73.9 (0.00) | 78.3 (0.00) | 47.8 (0.00) |
| DMA | 72.9 (3.04) | 70.6 (0.00) | 76.5 (0.00) | 76.5 (0.00) | 76.5 (0.00) | 24.1 (1.86) |
| ELC | 95.7 (0.00) | 95.7 (0.00) | 95.7 (0.00) | 91.3 (0.00) | 95.7 (0.00) | 91.3 (0.00) |
| GCE | 77.9 (2.22) | 78.9 (0.00) | 63.2 (0.00) | 78.9 (0.00) | 78.9 (0.00) | 43.7 (2.54) |
| ICE | 58.3 (0.00) | 58.3 (0.00) | 58.3 (0.00) | 54.2 (0.00) | 58.3 (0.00) | 25.0 (0.00) |
| IZH | 88.5 (0.00) | 92.3 (0.00) | 76.9 (0.00) | 88.5 (0.00) | 92.3 (0.00) | 46.2 (0.00) |
| JCR | 83.3 (0.00) | 83.3 (0.00) | 77.8 (0.00) | 88.9 (0.00) | 83.3 (0.00) | 25.0 (2.93) |
| JLD | 94.1 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 82.4 (4.80) |
| JMR | 85.7 (0.00) | 95.2 (0.00) | 95.2 (0.00) | 95.2 (0.00) | 95.2 (0.00) | 43.3 (1.51) |
| JSC | 72.1 (19.23) | 68.4 (0.00) | 68.4 (0.00) | 68.4 (0.00) | 68.4 (0.00) | 36.8 (4.30) |
| JST | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 91.1 (2.87) |
| LAC | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 91.6 (2.72) |
| LAG | 97.1 (1.51) | 92.9 (0.00) | 89.3 (0.00) | 96.4 (0.00) | 92.9 (0.00) | 71.4 (0.00) |
| LGP | 100.0 (0.00) | 96.0 (0.00) | 96.0 (0.00) | 96.0 (0.00) | 96.0 (0.00) | 88.0 (0.00) |
| PGA | 95.8 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 95.8 (0.00) | 100.0 (0.00) | 91.7 (0.00) |
| WFG | 82.8 (0.00) | 93.1 (0.00) | 93.1 (0.00) | 93.1 (0.00) | 93.1 (0.00) | 49.3 (4.00) |
| XCL | 100.0 (0.00) | 94.1 (0.00) | 94.1 (0.00) | 94.1 (0.00) | 94.1 (0.00) | 58.8 (0.00) |

Percentage of correctly predicted characters averaged out over subjects from the Akimpech dataset. The values in braces are the standard deviation over the different initializations.

Table 2: Akimpech Spelling Accuracies using 10 repetitions

| | OFF-US | OFF-US-T | ON-US-T | OA-US-T | RE-OA-US-T | OA-US |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|
| ACS | 100.0 (0.00) | 94.7 (0.00) | 84.2 (0.00) | 94.7 (0.00) | 100.0 (0.00) | 83.7 (5.79) |
| ASG | 90.5 (0.00) | 90.5 (0.00) | 90.5 (0.00) | 90.5 (0.00) | 90.5 (0.00) | 74.3 (4.02) |
| ASR | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 96.9 (2.43) |
| CLL | 96.2 (0.00) | 96.2 (0.00) | 96.2 (0.00) | 96.2 (0.00) | 96.2 (0.00) | 90.4 (2.72) |
| DCM | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 96.6 (3.25) |
| DLP | 95.7 (0.00) | 91.3 (0.00) | 82.6 (0.00) | 91.3 (0.00) | 91.3 (0.00) | 79.6 (5.44) |
| DMA | 88.2 (0.00) | 94.1 (0.00) | 88.2 (0.00) | 94.1 (0.00) | 94.1 (0.00) | 60.0 (2.48) |
| ELC | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 98.7 (2.93) |
| GCE | 84.2 (0.00) | 84.2 (0.00) | 94.7 (0.00) | 89.5 (0.00) | 84.2 (0.00) | 47.9 (11.49) |
| ICE | 87.5 (0.00) | 91.7 (0.00) | 95.8 (0.00) | 95.8 (0.00) | 91.7 (0.00) | 58.3 (0.00) |
| IZH | 100.0 (0.00) | 100.0 (0.00) | 96.2 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 91.9 (2.84) |
| JCR | 100.0 (0.00) | 100.0 (0.00) | 94.4 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 88.9 (0.00) |
| JLD | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 97.6 (3.04) |
| JMR | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 82.9 (2.46) |
| JSC | 89.5 (0.00) | 84.2 (0.00) | 84.2 (0.00) | 84.2 (0.00) | 84.2 (0.00) | 66.8 (4.99) |
| JST | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) |
| LAC | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 93.7 (2.22) |
| LAG | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 90.4 (2.41) |
| LGP | 100.0 (0.00) | 96.0 (0.00) | 96.0 (0.00) | 96.0 (0.00) | 96.0 (0.00) | 95.6 (2.95) |
| PGA | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 88.3 (2.64) |
| WFG | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 96.9 (1.09) |
| XCL | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 82.9 (1.86) |

Percentage of correctly predicted characters averaged out over subjects from the Akimpech dataset. The values in braces are the standard deviation over the different initializations.

Table 3: Akimpech Spelling Accuracies using 15 repetitions

| | OFF-US | OFF-US-T | ON-US-T | OA-US-T | RE-OA-US-T | OA-US |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|
| ACS | 94.7 (0.00) | 94.7 (0.00) | 89.5 (0.00) | 94.7 (0.00) | 94.7 (0.00) | 90.0 (5.23) |
| ASG | 95.2 (0.00) | 95.2 (0.00) | 100.0 (0.00) | 95.2 (0.00) | 95.2 (0.00) | 94.8 (1.51) |
| ASR | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) |
| CLL | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 93.1 (1.62) |
| DCM | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 99.7 (1.09) |
| DLP | 100.0 (0.00) | 100.0 (0.00) | 91.3 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 87.0 (4.10) |
| DMA | 94.1 (0.00) | 94.1 (0.00) | 94.1 (0.00) | 94.1 (0.00) | 94.1 (0.00) | 86.5 (2.84) |
| ELC | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 97.0 (3.58) |
| GCE | 89.5 (0.00) | 89.5 (0.00) | 89.5 (0.00) | 89.5 (0.00) | 89.5 (0.00) | 75.3 (4.99) |
| ICE | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 90.0 (2.91) |
| IZH | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 98.5 (1.99) |
| JCR | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 92.2 (3.88) |
| JLD | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 98.8 (2.48) |
| JMR | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 93.8 (2.30) |
| JSC | 100.0 (0.00) | 100.0 (0.00) | 94.7 (0.00) | 89.5 (0.00) | 100.0 (0.00) | 83.7 (2.99) |
| JST | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 97.8 (2.87) |
| LAC | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 94.2 (4.61) |
| LAG | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 97.5 (2.41) |
| LGP | 100.0 (0.00) | 100.0 (0.00) | 96.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 93.2 (5.01) |
| PGA | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 91.2 (2.37) |
| WFG | 100.0 (0.00) | 100.0 (0.00) | 96.6 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 94.5 (1.78) |
| XCL | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 100.0 (0.00) | 98.8 (2.48) |

Percentage of correctly predicted characters averaged out over subjects from the Akimpech dataset. The values in braces are the standard deviation over the different initializations.