**Supplementary File 1:** Summary of psychophysics testing for each subject. For detection and discrimination trials the threshold (TH) and JND per stimulation channel are listed along with the corresponding frequency and pulse width that were used.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Subject** | **Electrode** | **Receptive Field** | **minimum modal amplitude (mA)** | **Detection** | **Discrimination** | **Magnitude estimation** |
| **TH (mA)** | **F****(Hz)** | **PW (µs)** | **JND*low* (µA)** | **JND*high* (µA)** | **F****(Hz)** | **PW****(µs)** | **slope** | **R2** |
| 1 | 1 | D1–D2 | 5.48 | 3.75 | 100 | 200 |   | 618 | 100 | 1000 | 0.37 | 0.62 |
| 2 | Palm (ulnar) | 5.0 |  |  |  |  |  |  |  | 1.07 | 0.42 |
| 3 | Palm (ulnar) | 4.0 | 3.75 | 100 | 200 |  |  |  |  | 1.7 | 0.68 |
| 2 | 1 | Hand | 4.0 | 1.14 | 20 | 200 |   |   |   |   | 3.18 | 0.78 |
| 2 | Thumb | 3.0 | 1.21 | 20 | 200 | 245 |  | 20 | 200 | 2.36 | 0.71 |
| 3 | Hand | 4.0 |  |  |  |  |  |  |  | 2.21 | 0.76 |
| 4 | Palm, D1 | 3.0 | 1.11 | 20 | 200 |  |  |  |  | 2.74 | 0.7 |
| 5 | Thumb | 3.0 | 0.92 | 20 | 200 |   |   |   |   | 1.2 | 0.33 |
| 3 | 1 | Hand | 6.0 | 1.98 | 50 | 200 |  |  |  |  | 0.94 | 0.74 |
| 2 | Hand | 5.0 | 2.17 | 50 | 200 |  |  |  |  | 1.33 | 0.73 |
| 3 | Hand | 5.0 | 1.67 | 50 | 200 | 151 |  | 50 | 200 | 1.27 | 0.76 |
| 4 | Palm, D1–D4 | 3.0 | 0.97 | 50 | 200 |  |  |  |  |  |  |
| 5 | Palm, D3–D4 | 4.0 | 1.28 | 50 | 200 |  |  |  |  | 1.22 | 0.87 |
| 6 | Palm, D1–D4 | 5.0 | 1.53 | 50 | 200 |  |  |  |  | 1.18 | 0.74 |
| 7 | Palm, D1–D4 | 4.0 | 1.48 |  |  |  |  |  |  | 1.58 | 0.79 |
| 8 | Palm, D3–D4 | 5.0 | 1.65 | 50 | 200 |  |  |  |  | 1.39 | 0.81 |
| 9 | Palm, D2–D4 | 3.0 |  |  |  |  |  |  |  | 1.43 | 0.69 |
| 4 | 1 | Hand | 3.0 | 1.52 | 50 | 200 |   |   |   |   |   |   |
| 2 | D2, D4 | 4.0 |  |  |  |  |  |  |  |  |  |
| 3 | D2 | 2.0 | 1.5 |  |  |  |  |  |  |  |  |
| 4 | D1, D2 | 3.0 | 2.02 | 50 | 200 | 62 | 222 | 50 | 200 | 1.37 | 0.88 |
| 5 | Thumb, D1, D2 | 3.0 | 2.21 | 50 | 200 |  | 527 | 50 | 200 | 1.39 | 0.83 |
| 6 | Thumb, D1, D2 | 3.0 | 2.38 |  |  |  |  |  |  | 1.33 | 0.87 |
| 7 | Thumb, D1 | 3.0 | 1.97 | 50 | 200 |  |  |  |  |  |  |
| 8 | Thumb, D1 | 3.0 | 1.95 | 50 | 200 | 27 | 647 | 50 | 200 | 1.49 | 0.92 |
| 9 | Palm, Thumb, D1–D3 | 3.0 | 2.14 | 50 | 200 | 59 | 516 | 50 | 200 | 1.32 | 0.91 |
| 10 | D2, D3 | 3.0 | 1.98 | 50 | 200 | 44 | 488 | 50 | 200 | 1.29 | 0.86 |
| 11 | Thumb, D1, D2 | 3.0 | 2.13 | 50 | 200 | 54 | 300 | 100 | 200 | 1.32 | 0.91 |
| 12 | Hand | 3.0 |  |  |  |  |  |  |  |  |  |
| 13 | Hand | 3.0 | 1.5 |  |  |  |  |  |  |  |  |
| 14 | Hand | 2.0 | 1.95 | 50 | 200 |  |  |  |  |  |  |
| 15 | Hand | 3.0 | 2.1 | 50 | 200 |  |  |  |  |  |  |
| 16 | Thumb, D1 | 3.0 | 1.83 | 50 | 200 | 96 | 360 | 50 | 200 | 1.36 | 0.89 |