# Annex 1

Cosine similarity was used to compare the average muscle weightings of each MS with averaged values of previously reported MS extracted using NNMF of the same eight muscles during gait for healthy individuals (Clark, Ting, Zajac, Neptune, & Kautz, 2010). Cosine similarity were calculated as the inner product of two muscle vectors representing the averaged muscle activation of the eight muscles for each walking condition.

Cosine similarities (CS) values between muscle synergies weightings of the current study and synergies previously reported in the literature among healthy participants. Bold values indicate the two highest CS value for each synergy.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Clark Synergy | Synergy C1 | Synergy C2 | Synergy C3 | Synergy C4 |
| Sympt | Asympt | Sympt | Asympt | Sympt | Asympt | Sympt | Asympt |
|  | Natural Speed |
| C1  | **0.960** | **0.948** | 0.388 | 0.429 | 0.663 | 0.760 | 0.498 | 0.572 |
| C2 | 0.319 | 0.319 | **0.993** | **0.983** | 0.281 | 0.281 | 0.241 | 0.234 |
| C3 | 0.713 | 0.735 | 0.295 | 0.362 | **0.958** | **0.927** | 0.576 | 0.601 |
| C4 | 0.379 | 0.521 | 0.191 | 0.206 | 0.518 | 0.486 | **0.935** | **0.928** |
|  | Fast Speed |
| C1 | **0.953** | **0.936** | 0.379 | 0.418 | 0.666 | 0.734 | 0.564 | 0.571 |
| C2 | 0.321 | 0.310 | **0.992** | **0.983** | 0.310 | 0.299 | 0.227 | 0.258 |
| C3 | 0.751 | 0.717 | 0.292 | 0.354 | **0.972** | **0.937** | 0.606 | 0.653 |
| C4 | 0.518 | 0.621 | 0.184 | 0.203 | 0.417 | 0.499 | **0.937** | **0.905** |

**Reference**

Clark, D. J., Ting, L. H., Zajac, F. E., Neptune, R. R., & Kautz, S. A. (2010). Merging of healthy motor modules predicts reduced locomotor performance and muscle coordination complexity post-stroke. *J Neurophysiol, 103*(2), 844-857. doi:10.1152/jn.00825.2009