

Supplemental Material. The Effects of Motor
Modularity on Performance, Learning, and
Generalizability in Upper-Extremity Reaching: a
Computational Analysis

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Nbr	Muscle
1	Deltoid Anterior
2	Deltoid Medial
3	Deltoid Posterior
4	Supraspinatus
5	Infraspinatus
6	Subscapularis
7	Teres minor
8	Teres major
9	Pectoralis major Clavicular
10	Pectoralis major Sternal
11	Pectoralis major Ribs
12	Latissimus dorsi Thoracic
13	Latissimus dorsi Lumbar
14	Latissimus dorsi Iliac
15	Coracobrachialis
16	Elbow Triceps Long
17	Elbow Triceps Lateral

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18	Elbow Triceps Medial
19	Anconeuse
20	Supinator
21	Biceps Brachialis
22	Biceps Brachioradialis
23	Extensor carpi radialis longus
24	Extensor carpi radialis brevis
25	Extensor carpi ulnaris
26	Flexor carpi radialis
27	Flexor carpi ulnaris
28	Palmaris longus
29	Pronator teres
30	Pronator quadratus
31	Flexor digitorum superficialis Digit 5
32	Flexor digitorum superficialis Digit 4
33	Flexor digitorum superficialis Digit 3
34	Flexor digitorum superficialis Digit 2
35	Flexor digitorum profundus Digit 5
36	Flexor digitorum profundus Digit 4
37	Flexor digitorum profundus Digit 3
38	Flexor digitorum profundus Digit 2
39	Extensor digitorum communis Digit 5
40	Extensor digitorum communis Digit 4
41	Extensor digitorum communis Digit 3
42	Extensor digitorum communis Digit 2
43	Extensor digiti minimi
44	Extensor indicis propius
45	Extensor pollicis longus
46	Extensor pollicis brevis
47	Flexor pollicis longus

Table S1: **Muscle for each number.**

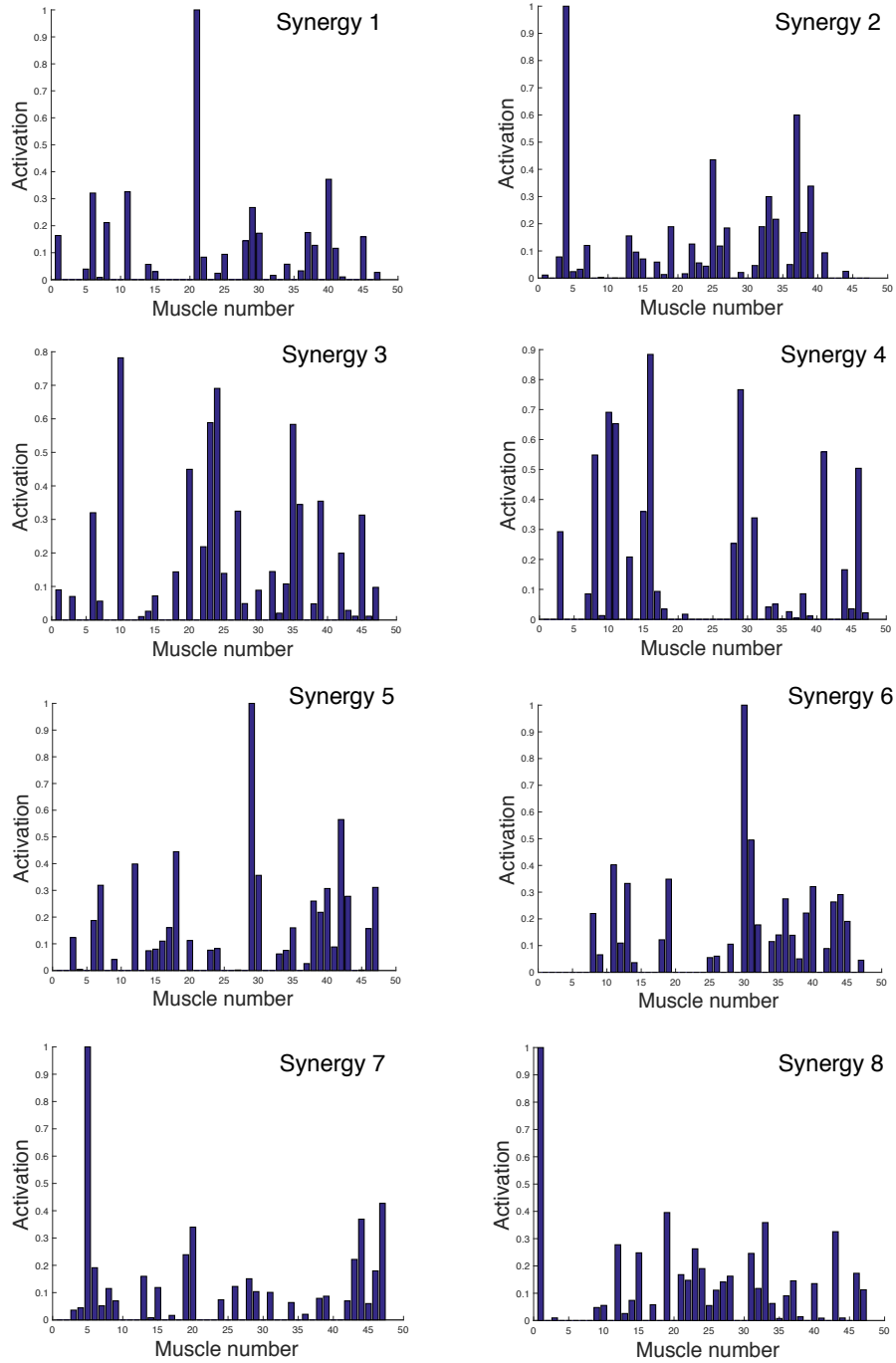


Figure S1: First eight synergies computed by NNMF..

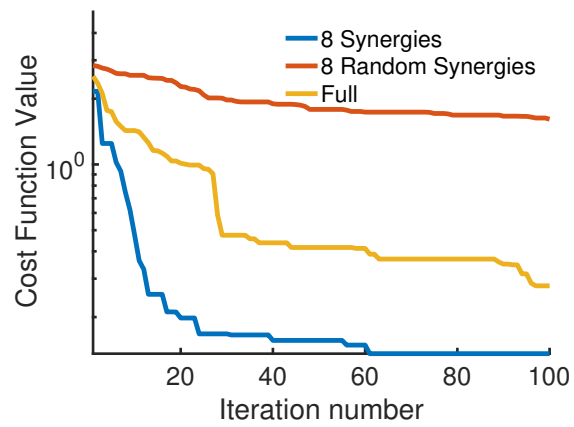


Figure S2: **Effect of synergies on convergence rates.** Convergence rate for the controller with 8 synergies (blue) compared to 8 random synergies (red) and the full-dimensional system (yellow) for a representative run.