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Supplementary information

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A neuroprosthesis for restoring hand movement and sensation in a person with complete tetraplegia

In the format provided by the authors and unedited

Supplementary Information

Bouton_Supplementary_Video_1.mp4

Supplementary Video 1. Participant demonstrates cortically mediated light grasping through neuromuscular electrical stimulation

Bouton_Supplementary_Video_2.mp4

Supplementary Video 2. Participant demonstrates cortically mediated precision grasping and self-feeding using an active orthosis

Bouton_Supplementary_Video_3.mp4

Supplementary Video 3. Participant demonstrates cortically mediated fine grasping with force-control using an RL in loop

Supplementary Table 1. Optimized structural and functional MRI scan parameters for localizing hand regions in the primary motor and somatosensory cortices.

Structural and functional MRI scan parameters	
T1-weighted (T1w) 3D MPRAGE sequence	
Isotropic resolution	0.8 mm
TR/TE/TI	2400/2.22/1000
Flip angle	8°
In-plane under-sampling (GRAPPA)	2
Acquisition time	7 min
T2-weighted (T2w) 3D turbo spin echo (SPACE) sequence	
Isotropic resolution	0.8 mm
TR/TE	3200/564 ms
In-plane under-sampling (GRAPPA)	2
Acquisition time	6 min
Task fMRI using the CMRR implementation of multiband gradient echo echo-planar imaging (EPI) sequence	
Isotropic resolution	2.1 mm
TR/TE	751/35 ms
Flip angle	60°
Slices	72
Multiband factor	725
FOV	228 mm × 228 mm
Matrix size	108 × 108
Phase partial Fourier	7/8
Phase encoding direction	anterior-posterior (A-P)
Echo spacing	0.68 ms
Measurements	330 in 4 mins

A pair of reversed polarity (A-P/P-A) spin echo EPI field mapping acquisitions with matched echo train length and echo spacing to the fMRI acquisition were also acquired