

HUNTER R. SCHONE

University of Pittsburgh
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Education & Academic Positions

University of Pittsburgh , Department of Physical Medicine and Rehabilitation Postdoctoral Fellow, <i>Advisor: Jennifer Collinger, PhD</i>	Pittsburgh, PA 2023–Present
University College London – National Institutes of Health , Joint Doctoral Training Program PhD Neuroscience, <i>Advisors: Chris I Baker, PhD & Tamar Makin, PhD</i>	London, UK 2018–2023
University of Oxford , Wellcome Centre for Integrative Neuroimaging Research Assistant, <i>Advisor: Tamar Makin, PhD</i>	Oxford, UK 2017–2018
University College London , Institute of Neurology (graduated with <i>distinction</i>) MSc Clinical Neuroscience, <i>Advisor: Tamar Makin, PhD</i>	London, UK 2016–2017
Westminster College B.Sc. Neuroscience, <i>Advisor: Lesa Ellis, PhD</i>	Salt Lake City, UT 2014–2016
Brigham Young University	Provo, UT 2011–2014

Publications

Peer-Reviewed Papers

Schone, H.R., Maimon Mor, R.O., Kollamkulam, M., Szymanska, M.A., Gerrand, C., Woolard, A., Kang, N., Baker, C.I., and Makin, T.R. (accepted). Stable cortical body maps before and after arm amputation. *Nature Neuroscience* (preprint available on *bioRxiv*, doi: 10.1101/2023.12.13.571314v2).

Kunigk, N.G., **Schone, H.R.**, Gontier, C., Hockeimer, W., Tortolani, A.F., Hatsopoulos, H.G., Downey, J.E., Chase, S.M., Boninger, M.I., Dekleva, B.D., Collinger, J.L. (2025). Motor somatotopy impacts imagery strategy success in human intracortical brain-computer interfaces. *Journal of Neural Engineering*, doi: 10.1088/1741-2552/adb995.

Ikegaya, N., Mallela, A.N., Warnke, P.C., Kunigk, N.G., Liu, F., **Schone, H.R.**, Verbaarschot, C., Hatsopoulos, H.G., Downey, J.E., Boninger, M.I., Gaunt, R.A., Collinger, J.L., Gonzalez-Martinez, J. (2024). A novel robot-assisted method for implanting intracortical sensorimotor devices for brain computer interface studies: principles, surgical techniques, and challenges. *Journal of Neurosurgery*, doi: 10.3171/2024.7.JNS241296.

Downey, J.E., **Schone, H.R.**, Foldes, S.T., Greenspon, C., Liu, F., Verbaarschot, C., Biro, D., Satzer, D., Moon, C., Coffman, B., Youssofzadeh, Y., Fields, D., Hobbs, T.G., Okorokova, E., Tyler-Kabara, E.C., Warnke, P.C., Gonzalez-Martinez, J., Hatsopoulos, H.G., Bensmaia, S.J., Boninger, M.I., Gaunt*, R.A., Collinger, J.L.* (2024). A roadmap for implanting electrode arrays to evoke tactile sensations through intracortical microstimulation. *Human Brain Mapping*, doi: 10.1002/hbm.70118.

Schone, H.R., Udeozor, M, Moninghoff, M., Rispoli, B., Vandersea, J., Lock, B., Hargrove, L., Makin, T.R. and Baker, C.I (2024). Biomimetic versus arbitrary motor control strategies for bionic hand skill learning. *Nature Human Behaviour*, doi: 10.1038/s41562-023-01811-6.

Love, K., Cao, D., Chang, J., Dal’Bello, L.R., Ma, X., O’Shea, D.J., **Schone, H.R.**, Shahbazi, M., and Smoulder, A. (2024). Highlights from the 32nd Annual Meeting of the Society for the Neural Control of Movement. *Journal of Neurophysiology*. doi: 10.1152/jn.00428.2023

Schone, H.R., Baker, C.I, Katz, J., Nikolajsen, L., Limakatso, K., Flor, H. and Makin, T.R. (2022). Making sense of phantom limb pain. *Journal of Neurology, Neurosurgery & Psychiatry*, 93:833-843.

Schone, H.R.*, Maimon-Mor, R.O*, Baker, C.I., and Makin, T.R. (2021). Expert tool users show increased differentiation between visual representations of hands and tools. *Journal of Neuroscience*, 41 (13) 2980-2989.

Maimon-Mor, R.O., **Schone, H.R.**, Henderson-Slater, D., Faisal, A. and Makin, T.R. (2021). Early life experience sets hard limits on motor learning as evidenced from artificial arm use, *eLife*, 10: e66320.

Maimon-Mor, R. O*, **Schone, H. R.***, Moran, R., Brugger, P. and Makin, T. R. (2020). Motor control drives visual bodily judgements. *Cognition*, 196, 104120.

In preparation

Schone, H.R., Yoo, P., Fry, A., Herbers, C., Chetty, N., Liu, F., Hong-Moon, C., Hill, K., Majidi, S., Harel, N.Y., Nogueira, R.G., Levy, E., Putrino, D.F., Lacomis, D., Oxley, T.J., Weber, D.J. and Collinger, J.L. (in-prep). Motor cortex coverage predicts performance of a Stentrode neuroendovascular brain-computer interface.

Schone, H.R., Makin, T.R. and Baker, C.I (in-prep). Decoding actions and observations of hand gestures in the human brain.

Schone, H.R., Edwards, G., Japee, S., Makin, T.R. and Baker, C.I (in-prep). Neural adaptations associated with bionic hand skill learning.

Funding

National Institutes of Health F32 Postdoctoral Research Fellowship (3-years: \$240,000) 2024

Awards

Glushko Dissertation Prize, Cognitive Science Society 2024
Satellite for Society for the Neural Control of Movement Conference, *Best Poster Award* 2024
Brain-Computer Interface Society Travel Award 2023
Society for the Neural Control of Movement Conference Scholarship 2023
University College London Sully Scholarship 2020
Most outstanding department doctoral candidate
National Institutes of Health Graduate Student Research Award Winner - Neuroscience 2020
UCL-NIMH Research Symposium Top Oral Presentation 2019

Invited Talks

International Society of Electrophysiology and Kinesiology, DeLuca Symposium	2025
ETH Zurich	2024
Faculty of Pain Medicine of the Royal College of Anesthetists	2024
Johns Hopkins University, TNT Seminar Series	2024
University of Toronto, Human Pain Seminar Series	2024
University of Pittsburgh, Visual Prosthesis Group	2024
University of Cambridge, MRC Cognition and Brain Sciences Unit	2023
University of Pittsburgh, Rehabilitation and Neural Engineering Lab	2023
National Institutes of Health, Laboratory of Brain and Cognition	2022
Wellcome Center for Human Neuroimaging, University College London, Brain Seminar Series	2022

Conference Presentations

Organized Symposia/Workshop

Schone, H.R. (2025). “Building consensus on implant targeting strategies for intracortical sensorimotor brain-computer interfaces” Workshop co-organized with David Bjånes. *BCI Society Meeting*, Banff, Canada.

Schone, H.R. (2022). “Experience-Dependent Plasticity: Gaining Insights Into the Neural Capacity to Adapt.” Nanosymposium presented at the *Society for Neuroscience (SfN)*, San Diego, CA.

Talks* and Posters*

***Schone, H.R.** (2025). Mapping “motor cortex” for guiding placement of brain-computer interfaces. *BCI Society Meeting*, Banff, Canada.

***Schone, H.R.**, Yoo, P., Herbers, C., Liu, F., Moon, C.H., Putrino, D., Majidi, S., Harel, N.Y., Lacomis, D., Nogueira, R.G., Levy, E., Oxley, T.J., Weber, D.J., and Collinger, J.L. (2024) Neuroimaging predictors of Stentrode endovascular signal quality. *Society for Neuroscience Conference*, Chicago, IL, USA.

***Schone, H.R.** (2024). Neurocognitive considerations for engineering bionic limbs. *Cognitive Science Society*, Rotterdam, Netherlands.

***Schone, H.R.**, Downey, J.E., Foldes, S.T., Greenspon, C., Liu, F., Verbaarschot, C., Biro, D., Satzer, D., Moon, C., Coffman, B., Youssofzadeh, Y., Fields, D., Hobbs, T.G., Okorokova, E., Tyler-Kabara, E.C., Warnke, P.C., Gonzalez-Martinez, J., Hatsopoulos, H.G., Bensmaia, S.J., Boninger, M.I., Gaunt, R.A., and Collinger, J.L. (2024) A roadmap for implanting microelectrode arrays to evoke tactile sensations through intracortical microstimulation. *BRAIN Initiative Conference*, Rockville, MD, USA.

***Schone, H.R.**, Makin, T.R. and Baker, C.I. (2024). Decoding action and observation of hand gestures in the human brain. *Neural Control of Movement*, Dubrovnik, Croatia.

***Schone, H.R.**, Downey, J.E., Foldes, S.T., Greenspon, C., Liu, F., Verbaarschot, C., Biro, D., Satzer, D., Moon, C., Coffman, B., Youssofzadeh, Y., Fields, D., Hobbs, T.G., Okorokova, E., Tyler-Kabara, E.C., Warnke, P.C., Gonzalez-

Martinex, J., Hatsopoulos, H.G., Bensmaia, S.J., Boninger, M.I., Gaunt, R.A., and Collinger, J.L. (2024) Using multidodal neuroimaging to guide brain-computer interface implantation. Satellite Meeting for *Neural Control of Movement*, Dubrovnik, Croatia.

***Schone, H.R.** (2023). Does the cortical hand representation change following amputation? A pre- and post amputation fMRI study. *UCL-NIMH Joint Symposium*, London, UK, USA.

***Schone, H.R.**, Udeozor, M., Moningerhoff, M., Rispoli, B., Vandersea, J., Lock, B., Hargrove, L., Makin, T.R. and Baker, C.I. (2023) Should bionic limb control mimic the human body? Impact of control strategy on bionic hand skill learning. *Brain Computer Interface Meeting*, Brussels, Belgium.

***Schone, H.R.**, Makin, T.R., and Baker, C.I. (2023). Human See, Human Do: comparing motor and visual representations of hand gestures. *Vision Sciences Society*, Florida, USA.

***Schone, H.R.**, Kollamkulam, M., Gerrand, C., Sedki, I., Maimon-Mor, R. O., Baker, C.I. and Makin, T.R. (2023). How does the cortical hand representation change following amputation? A pre- and post-amputation fMRI study. *Neural Control of Movement*, Victoria, Canada.

***Schone, H.R.**, Kollamkulam, M., Gerrand, C., Sedki, I., Maimon-Mor, R. O., Baker, C.I. and Makin, T.R. (2022). How does the cortical hand representation change following amputation? A pre- and post-amputation fMRI study. *Society for Neuroscience*, San Diego, California, USA.

***Schone, H.R.**, Udeozor, M., Moningerhoff, M., Rispoli, B., Vandersea, J., Lock, B., Hargrove, L., Makin, T.R. and Baker, C.I. (2022) Is the human body the best model for controlling artificial limbs? Comparing biomimetic and arbitrary control strategies. *Society for Neuroscience*, San Diego, California, USA.

***Schone, H.R.**, Edwards, G., Japee, S., Makin, T.R., and Baker, C.I. (2022) Decoding action and observation of biological and robotic hand gestures. *Society for Neuroscience*, San Diego, California, USA.

***Schone, H.R.**, Udeozor, M., Moningerhoff, M., Rispoli, B., Vandersea, J., Lock, B., Hargrove, L., Edwards, G.E., Japee, S.J., Makin, T.R. and Baker, C.I. (2022) Is the human body the best model for controlling artificial limbs? Comparing biomimetic and arbitrary control strategies. *Neural Control of Movement*, Dublin, Ireland.

***Schone, H.R.** (2021). Is the human body the ultimate design template for artificial limbs? *EMBC Conference workshop: From machine-brain interfaces (MBI) to neurorobotics: challenges and opportunities*. <https://neuroeng.org/workshop-embc2021>.

***Schone, H.R.**, Maimon-Mor, R.O., Baker, C.I., and Makin, T.R. (2020). Expert tool users do not visually embody their hand-held tool. *Vision Sciences Society*, St. Pete Beach, Florida, USA.

***Schone, H.R.**, Gerrand, C., Sedki, I., Maimon-Mor, R. O., Baker, C.I. and Makin, T.R. (2020). Preserved somatotopic organisation following hand amputation. *British Sarcoma Conference*, Glasgow, Scotland, UK.

***Schone, H.R.**, Maimon-Mor, R.O., Baker, C.I., and Makin, T.R. (2020). Expert tool users do not visually embody their hand-held tool. *Capital Area Cognition, Attention and Perception Conference*, Washington, D.C.

***Schone, H.R.**, Maimon-Mor, R.O., Baker, C.I. and Makin, T.R. (2019). Investigating the neural embodiment of prosthetic limbs and tools. *Society for Neuroscience*, Chicago, Illinois, USA.

***Schone, H.R.**, Maimon-Mor, R.O., Baker, C.I. and Makin, T.R. (2019). Assessing prosthesis embodiment in elite prosthesis users. *UCL-NIMH Joint Symposium*, Bethesda, MD, USA.

***Schone, H.R.**, Maimon-Mor, R.O., Baker, C.I. and Makin, T.R. (2019). Assessing the neurocognitive characteristics of elite prosthesis users. *Trent International Prosthetics Symposium*, Manchester, UK.

***Schone, H.R.**, Maimon-Mor, R.O., Moran, R., Brugger, P. and Makin, T.R. (2018). Bimanual sensorimotor system is more effective than a unimanual system. *Hand, Brain and Technology conference*, Ascona, Switzerland.

***Schone, H.R.**, Maimon-Mor, R.O. and Makin, T.R. (2017). Assessing embodiment with visual priming tasks. *Queen Square Symposium*, London, UK.

***Schone, H.R.** (2016). *TEDx WestminsterCollegeSLC*, Salt Lake City, UT.

Service, Mentoring & Outreach

Academic Service

<i>Committee Member</i> , Brain-Computer Interface Society Postdoctoral Student Committee	2021-2023
<i>Graduate Student Representative</i> , Faculty of Brain Sciences, University College London	2016-2017
<i>Committee Member</i> , University College London Executive Student Union	2016-2017
<i>Committee Member</i> , Brigham Young University Neuroscience Student Association	2012-2014
<i>Student Editor</i> , Chiasm, BYU Neuroscience Journal	2013-2014

Mentoring

Mathew Kollamkulam: Masters Research Student, University College London (2020-2022)
Malcolm Udeozor: Postbaccalaureate Trainee, National Institutes of Health (2020-2023)
R'ay Fodor: Postbaccalaureate Trainee, National Institutes of Health (2019-2021)
Mae Moninghoff: Postbaccalaureate Trainee, National Institutes of Health (2021-2023)
Mentor, Out in Science Technology, Engineering and Math (oSTEM; 2021-Present)

Community Outreach

<i>Organizer</i> , Adult Coding Course at University of Pittsburgh's Community Engagement Center	2023-2024
<i>Organizer</i> , BCI Society Industry-Academia Seminar Series	2021-2023
<i>Volunteer judge</i> , National Institute of Health Postbac Poster Day	2021-2022
<i>Volunteer</i> , REACH charity Annual Family Weekend	2019
<i>Volunteer</i> , Alzheimer's Association, Salt Lake City, UT Chapter	2013-2016
<i>Volunteer</i> , Green City and Shree Binayak Hospitals in Kathmandu, Nepal	2014
<i>Organizer</i> , University 5k Fun Run – raised \$15,000 for the IFOPA organization	2014
<i>Volunteer student emergency medical technician</i> , BYU	2013
<i>Tutor</i> , Orem Jr. High School After-School Tutoring Program	2013
<i>Volunteer</i> , Intermountain Healthcare, Department of Radiology	2012-2014

Commitments to Equality, Inclusion and Diversity

Member, Visibility: LGBTQ society of the Vision Sciences Society
Mentor, Out in Science Technology, Engineering and Math (oSTEM)

2021-2023
2021-Present

Reviewing

I have reviewed 14 journal submissions (not including resubmissions): BMC Surgery, Brain, Brain Communications, Cerebral Cortex, Consciousness and Cognition, Experimental Brain Research, Imaging Neuroscience, Journal of Pain, Journal of Physiology, Lancet Neurology, Perception, Neuropsychologia, Science Robotics, and Scientific Reports.

Media Coverage

Interviewed, New Scientist: “Prosthetic hands are easier to control using unrelated muscles”	2024
Interviewed, Scientific American: “To The Brain, a Tool Is Just a Tool, Not a Hand Extension”	2021
Interviewed, BBC World News: “Phantom Limb Pain”	2019
Interviewed, Book, Beautiful Trauma by Rebecca Fogg	2018