Charles Damian “Chuck” Holmes

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Education

2022	Ph.D. in Biomedical Engineering, Washington University in St. Louis *Dissertation: Mechanisms of Primate Working Memory*
2017	M.S. in Biomedical Engineering, Washington University in St. Louis
2012	B.S. in Electrical Engineering, Washington University in St. Louis

Employment

2023 – present	Visiting Researcher, Salk Institute for Biological Studies
2023 – present	Post-Doctoral Researcher, Department of Cognitive Science, Univerity of California San Diego
2012 – 2013	Software Engineer, The Boeing Company
2012	Consultant, Neurolutions, LLC
2010 – 2012	Level I Technician, Student Technology Services, Washington University in St. Louis
2009 – 2012	Software Engineering Intern, Lickenbrock Technologies, LLC

Supplementary Education

- Cognitive and Computational Systems Neuroscience Pathway, *2013 – 2016*
- Computational Sensory-Motor Neuroscience Summer School, *2016*

Honors and Awards

- Cognitive and Computational Systems Neuroscience Fellowship, *2015 – 2017*
- Eta Kappa Nu, Electrical Engineering Honorary, *2012*
- David Levy Electrical and Systems Engineering Award for Design Excellence, *2012*
- National Science Foundation Supplemental Grant for Undergraduate Research, *2011*

Teaching Experience

- Discussion Leader, Neural Systems, *2019 – 2021*
- Organizer and Discussion Leader, Cognitive and Computational Systems Neuroscience Journal Club, *2014 – 2015*
- Teaching Assistant, Bioelectric Phenomena, *2014*
- Teaching Assistant, Introduction to Computer Science, *2009*

Journal Publications

Holmes CD, Ching S, Snyder LH (2022) Primates chunk simultaneously-presented memoranda. Frontiers in Behavioral Neuroscience 16.

Papadimitriou C*, **Holmes CD***, Snyder LH (2021) Primate spatial memory cells become tuned early and lose tuning at cell-specific times. Cerebral Cortex 31:4206–4219. (**: co-first authors*)

Mooshagian E, **Holmes CD**, Snyder LH (2021) Local field potentials in the parietal reach region reveal mechanisms of bimanual coordination. Nature communications 12:1–13.

Holmes CD, Papadimitriou C, Snyder LH (2018) Dissociation of LFP power and tuning in the frontal cortex during memory. Journal of Neuroscience 38:8177–8186.

Mooshagian E, Wang C, **Holmes CD**, Snyder LH (2018) Single units in the posterior parietal cortex encode patterns of bimanual coordination. Cerebral Cortex 28:1549–1567.

Conference Presentations and Publications

Park J, **Holmes CD**, Snyder LH (2023) Task-specific neural modules for spatial working memory in the frontal cortex. In: Society for Neuroscience, Washington, DC.

Holmes CD, Ching S, Snyder LH (2022) Neuronal correlates of multi-item spatial memory. In: BRAIN Initiative, *Virtual*.

Holmes CD, Ching S, Snyder LH (2021) Measurement of inter-item dependence during multi-item memory. In: BRAIN Initiative, *Virtual*.

Mooshagian E, **Holmes CD**, Snyder LH (2019) Signals corresponding to bimanual movements in the posterior parietal cortex are shared across the hemispheres. In: Society for Neuroscience, Chicago, IL.

Holmes CD, Snyder LH (2019) Sequential-presentation of spatial memoranda may bias representations toward independence. In: American Neurological Association, St. Louis, MO.

Holmes CD, Snyder LH (2018) Sequential presentation of spatial target may bias multi-item memory toward independence. In: Society for Neuroscience, San Diego, CA.

Mooshagian E, **Holmes CD**, Snyder LH (2018) Beta frequency range local field potentials in the parietal reach region reveal mechanisms of bimanual coordination. In: Society for Neuroscience, San Diego, CA.

Mooshagian E, **Holmes CD**, Snyder LH (2017) Single-units in the lateral intraparietal area (LIP) distinguish between different patterns of unimanual and bimanual arm movements. In: Society for Neuroscience, Washington, DC.

Holmes CD, Papadimitriou C, Snyder LH (2016) Frontal cortical local field potentials (LFPs) reflect working memory processing over long delays. In: Society for Neuroscience, San Diego, CA.

Holmes CD, Papadimitriou C, Snyder LH (2015) Activity encoding spatial working memory in macaque frontal cortex is highly structured, yet incompatible with current attractor network models. In: Society for Neuroscience, Chicago, IL.

Undergraduate

Arthur RM, **Holmes CD**, Zhou W (2014) Real-time ultrasonic thermometry based on the change in backscatter energy. In: Society for Thermal Medicine, Minneapolis, MN.

Holmes CD, Wronkiewicz M, Somers T, Liu J, Kim D, Bundy D, Gilboa E, Leuthardt E (2012) Ipsihand bravo: An improved EEG-based brain-computer interface for hand motor control rehabilitation. In: International Conference of the IEEE Engineering in Medicine and Biology Society, San Diego, CA.

Fok S, Schwartz R, Wronkiewicz M, **Holmes CD**, Zhang J, Somers T, Bundy D, Leuthardt E (2011) An EEG-based brain computer interface for rehabilitation and restoration of hand control following stroke using ipsilateral cortical physiology. In: International Conference of the IEEE Engineering in Medicine and Biology Society, Boston, MA

Fok S, Schwartz R, Wronkiewicz M, Holmes J C. D. Zhang, Brodell N, Somers T, Bundy D, Leuthardt E (2011) Ipsihand: An EEG based brain computer interface for motor rehabilitation. In: Rehabilitation Engineering and Assistive Technology Society of North America Meeting, Student Design Competition Finals, Toronto, Canada.

Fok S, Schwartz R, Wronkiewicz M, **Holmes CD**, Zhang J, Brodell N, Somers T, Bundy D, Leuthardt E (2011) Ipsihand: An EEG based brain computer interface for motor rehabilitation. In: St. Louis Area Undergraduate Research Symposium, Carbondale, IL.

Fok S, Schwartz R, Wronkiewicz M, **Holmes CD**, Zhang J, Brodell N, Somers T, Bundy D, Leuthardt E (2011) Ipsihand: An EEG based brain computer interface for motor rehabilitation. In: Washington University in St. Louis Undergraduate Research Symposium, Keynote Presentation, St. Louis, MO.

Holmes CD, Eisner J, La Rosa P, Nehorai A (2010) Acoustic positioning system. In: Washington University in St. Louis Undergraduate Research Symposium, St. Louis, MO.

Extracurricular

Larkin S, Larson J, **Holmes CD**, Vaicik M, Turturro M, Jurkevich A, Sinha S, Ezashi T, Papavasilou G, Brey E, Holmes T (2015) 3D widefield light microscope image reconstruction without dyes. In: SPIE BIOS 2015. San Francisco, CA.

Holmes T, Larkin S, Larson J, **Holmes CD**, Vaicik M, Turturro M, Jurkevich A, Sinha S, Ezashi T, Papavasilou G, Brey E (2013) Multimodal 3D light microscopy without dye. In: Focus on microscopy conference 2013. Maastricht, The Netherlands.

Holmes T, Larkin S, **Holmes CD**, Larson J, Vaicik M, Tuturro M, Jurkevich A, Sinha S, Ezashi T, Papavasiliou G, Brey E (2012b) Multispectral/multimodal 3D image reconstruction without dyes. In: American society of cell biology annual meeting 2012. San Francisco, CA.

Holmes T, Larson J, Tuturro M, Vaicik M, Papavasiliou G, Larkin S, **Holmes CD**, Jurkevich A, Sinha S, Ezashi T, Brey E (2012a) Multimodality, multispectral and 3D light microscopy of engineered tissues without dyes. In: 3rd TERMIS world congress 2012. Vienna, Austria.

Extracurricular Activities

- Chapter Advisor, Tau Kappa Epsilon, Washington University in St. Louis, *2019 – present*
- Dancer, Sazon Acrobatic Latin Dance Team, Saint Louis University, *2019 – 2023*
- Choreographer and Dancer, Association of Latin American Students Carnaval Showcase, Washington University in St. Louis, *2014 – 2018*
- Other hobbies: *Cycling, Photography, Rock Climbing*