

Charles Damian Holmes

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Education

- 2022 **Washington University in St. Louis**, St. Louis, MO
Doctor of Philosophy in Biomedical Engineering
Dissertation title: Mechanisms of Primate Working Memory
- 2017 **Washington University in St. Louis**, St. Louis, MO
Master of Science in Biomedical Engineering
- 2012 **Washington University in St. Louis**, St. Louis, MO
Bachelor of Science in Electrical Engineering
Minor: Computer Science

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. (* *shared first authorship*)

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.

Conferences

Graduate

Holmes CD, Ching S, Snyder LH (2022) Neuronal correlates of multi-item spatial memory. In: 8th annual BRAIN initiative meeting.

Holmes CD, Ching S, Snyder LH (2021) Measurement of inter-item dependence during multi-item memory. In: 7th annual BRAIN initiative meeting.

Mooshagian EF, **Holmes CD**, Snyder LH (2019) Signals corresponding to bimanual movements in the posterior parietal cortex are shared across the hemispheres. In: 49th annual meeting of society for neuroscience (SfN). Chicago, IL.

Holmes CD, Snyder LH (2019) Sequential-presentation of spatial memoranda may bias representations toward independence. In: 144th annual meeting of american neurological association (ANA). Saint Louis, MO.

Holmes CD, Snyder LH (2018) Sequential presentation of spatial target may bias multi-item memory toward independence. In: 48th annual meeting of society for neuroscience (SfN). San Diego, CA.

Mooshagian EF, **Holmes CD**, Snyder LH (2018) Beta frequency range local field potentials in the parietal reach region reveal mechanisms of bimanual coordination. In: 48th annual meeting of society for neuroscience (SfN). San Diego, CA.

Mooshagian EF, **Holmes CD**, Snyder LH (2017) Single-units in the lateral intraparietal area (LIP) distinguish between different patterns of unimanual and bimanual arm movements. In: 47th annual meeting of society for neuroscience (SfN). Washington, DC.

Holmes CD, Papadimitriou C, Snyder LH (2016) Frontal cortical local field potentials (LFPs) reflect working memory processing over long delays. In: 46th annual meeting of society for neuroscience (SfN). 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: 45th annual meeting of society for neuroscience (SfN). 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 2014. 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: 34th annual 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 (2011a) An EEG-based brain computer interface for rehabilitation and restoration of hand control following stroke using ipsilateral cortical physiology. In: 33rd annual international conference of the IEEE engineering in medicine and biology society.

Fok S, Schwartz R, Wronkiewicz M, Holmes J C. D. Zhang, Brodell N, Somers T, Bundy D, Leuthardt E (2011b) Ipsihand: An EEG based brain computer interface for motor rehabilitation. In: Oral presentation, finalists, RESNA student design competition. Toronto, Canada.

Fok S, Schwartz R, Wronkiewicz M, **Holmes CD**, Zhang J, Brodell N, Somers T, Bundy D, Leuthardt E (2011c) Ipsihand: An EEG based brain computer interface for motor rehabilitation. In: Saint louis area undergraduate research symposium. Carbondale, IL.

Fok S, Schwartz R, Wronkiewicz M, **Holmes CD**, Zhang J, Brodell N, Somers T (2011d) IpsiHand: Direct recoupling of intention and movement. In: RESNA - student design competition.

Fok S, Schwartz R, Wronkiewicz M, **Holmes CD**, Zhang J, Brodell N, Somers T, Bundy D, Leuthardt E (2011e) Ipsihand: An EEG based brain computer interface for motor rehabilitation. In: Washington university in saint louis undergraduate research symposium, keynote presentation. Saint Louis, MO.

Holmes CD, Eisner J, La Rosa P, Nehorai A (2010) Acoustic positioning system. In: Washington university in saint louis undergraduate research symposium, keynote presentation. Saint Louis, MO.

Extracurricular

Larkin S, Larson J, **Holmes CD**, Vaicik M, Turturro M, Jurkevich A, Sinha S, Ezashi T, Papavasiliou 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, Papavasiliou 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, Turturro 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, Turturro 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.

Employment

2022–present	Washington University in St. Louis , St. Louis, MO Staff Scientist
2012–2013	The Boeing Company , Berkeley, MO Software Engineer
2012	Neuroolutions, LLC , St. Louis, MO Consultant
2010–2012	Student Technology Services , Washington University in St. Louis, St. Louis, MO Level I Technician
2009–2012	Lickenbrock Technologies, LLC , St. Louis, MO Software Engineering Intern

Teaching Experience

- Discussion Leader, *Neural Systems*, Washington University in St. Louis
- Graduate Teaching Assistant, *Bioelectric Phenomena*, Washington University in St. Louis
- Undergraduate Teaching Assistant, *Introduction to Computer Science*, Washington University in St. Louis

Awards and Honors

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