

Brett Jesse Graham

PhD

12 Webster St
Waltham MA, 02453
Phone: 302-588-1736
Email: brettgraham@gmail.com
Homepage: <http://jenandbrett.com/brett>

Current Position

2017-present Neuroengineer, Center for Brain Science, Harvard University
Project: Design and fabricate scientific instrumentation for 40+ labs
Supervisor: Ed Soucy PhD, <http://ntcore.org>

Education and Employment

2013-2017 Electron Microscopy Engineer, Harvard Medical School
Project: GridTape methodology and instrumentation
Lab PI: Wei-Chung Allen Lee PhD, <http://lee.hms.harvard.edu/>

2009-2013 Postdoctoral Researcher in Visual Neurophysiology, Harvard University
Project: High-throughput electrophysiology in rat visual cortices
Lab PI: David Cox PhD

2004-2009 PhD in Behavioral Neuroscience, University of Delaware
Dissertation: A functional study of the teleost nucleus isthmi:
 Sensing and attending to objects in the immediate environment
Advisor: David PM Northmore PhD

2000-2003 BA in Psychology, Millersville University of Pennsylvania

Publications

1. Susoy V, Hung W, Witvliet D, Whitener J, Wu M, **Graham B**, Zhen M, Venkatachalam V, Samuel A (2021) Natural sensory context drives diverse brain-wide activity during *C. elegans* mating, **Cell**, in press.
2. **Graham B***, Phelps J*, Hildebrand D*, Kuan A, Thomas L, Nguyen T, Buhmann J, Azevedo A, Sustar A, Agrawal S, Liu M, Shanny B, Funke J, Tuthill J, Lee W (2021) Reconstruction of motor control circuits in adult *Drosophila* using automated transmission electron microscopy, **Cell**, 184(3) 759-774. (* contributed equally)
3. Joo W, Vivian M, **Graham B**, Soucy E, Thyme S (2021) A Customizable Low-Cost System for Massively Parallel Zebrafish Behavioral Phenotyping. **Frontiers in**

- behavioral neuroscience*, 14, 258.
4. Yin W, Brittain D, Borseth J, Scott M, Williams D, Perkins J, Own C, Murfitt M, Torres R, Kapner D, Mahalingam G, Bleckert A, Castelli D, Reid D, Lee W, **Graham B**, Takeno M, Bumbarger D, Farrell C, Reid R, da Costa N (2020) A petascale automated imaging pipeline for mapping neuronal circuits with high-throughput transmission electron microscopy, *Nature Communications*, 11(1), 1-12.
 5. Hildebrand D, Cicconet M, Torres R, Choi W, Quan T, Moon J, Wetzel A, Champion A, **Graham B**, Randlett O, Plummer G, Portuges R, Bianco I, Saalfeld S, Baden A, Lillaney K, Burns R, Vogelstein J, Schier A, Lee WC, Jeong WK, Lichtman J, Engert F (2017) Whole-brain serial-section electron microscopy in larval zebrafish. *Nature*, 545, 345-349.
 6. Lee WC, Bonin V, Reed M, **Graham B**, Hood G, Glattfelder K & Reid RC (2016) Anatomy and function of an excitatory network in the visual cortex. *Nature*, 532(7599), 370-374.
 7. Own C, Murfitt M, Own L, Brittain D, da Costa N, Reid RC, Hildebrand D, **Graham B** & Lee WC (2015) Reel-to-Reel Electron Microscopy: Latency-Free Continuous Imaging of Large Sample Volumes. *Microscopy and Microanalysis*, 21(S3), 157-158.
 8. Zoccolan D, **Graham B**, & Cox D (2010) A self-calibrating, camera-based eye tracker for recording of rodent eye movements. *Frontiers in Neuroscience*. 4(193).
 9. Ortiz F E, **Graham B**, Spagnoli K & Kelmelis E J (2009) Biologically inspired collision avoidance system for unmanned vehicles. *SPIE Proceedings*. 7332(1), 73320B.
 10. **Graham B J** & Northmore D P M (2007) A spiking neural model of midbrain visuomotor mechanisms that avoids objects by estimating size and distance monocularly. *Neurocomputing*, 70(10-12), 1983-1987.
 11. **Graham B J** & Northmore D P M (2006) A model of proximity measurement by the teleost nucleus isthmi. *Neurocomputing*, 69(10-12), 1281-1285.
 12. Northmore D P M & **Graham B J** (2005) Avoidance behavior controlled by a model of vertebrate midbrain mechanism. *Lecture Notes in Computer Science*, 3561, 338-345.

Patents

Hildebrand D, **Graham B** & Lee WC (2016) GridTape for Fast Nanoscale Imaging.
US20200355583A1

Abstracts and Conference Presentations

1. **Graham B** (April 2017) GridTape. Invited talk, Max Planck/HHMI Connectomics Conference, Berlin, Germany.
2. Marra K, **Graham B**, Carouso S & Cox D (Mar, 2012) Implementation of a

- Peltier-based cooling device for localized deep cortical deactivation during in vivo object recognition testing. APS Meeting Abstracts, Boston, MA.
3. **Graham B**, Carouso S & Cox D (Nov, 2011) High resolution stereotaxy using structured light imaging. Poster session at Society for Neuroscience, Washington, DC.
 4. Ortiz F E, Spagnoli K & **Graham B** (Apr, 2009) Biologically inspired collision avoidance system for unmanned vehicles. Presented at SPIE: Defense, Security and Sensing, Orlando, FL.
 5. **Graham B J** & Northmore D P M (Nov, 2008) Sensing the distance of looming objects from a monocular visual image: a parametric examination of the teleost nucleus isthmi. Poster session presented at Society for Neuroscience, Washington, DC.
 6. **Graham B J** & Northmore D P M (Feb, 2008) Monocular proximity derivation in the teleost midbrain. Poster session presented at Computational and Systems Neuroscience, Salt Lake City, UT.
 7. **Graham B J** & Northmore D P M (Oct, 2006) Bi-directional communication of posterior commissure axons between the nuclei isthmi in a teleost. Poster session presented at Society for Neuroscience, Atlanta, GA.
 8. **Graham B J** & Northmore D P M (July, 2006) Spiking neuron models based on midbrain mechanisms that guide visual behavior. Poster session presented at Computational Neuroscience Meeting, Edinburgh, Scotland.
 9. **Graham B J** & Northmore D P M (July, 2005) A model of proximity measurement by the teleost nucleus isthmi. Poster session presented at Computational Neuroscience Meeting, Madison, WI.

Grants

2008 Improvements to Sense and Avoid (SAA) Systems for Unmanned Aircraft Systems (UAS), Air Force SBIR, AF081-069.
Fernando E. Ortiz PhD, Principal Investigator (EM Photonics)
Brett Graham PhD (Consultant, University of Delaware)
David PM Northmore PhD, (Consultant, University of Delaware)

Awards and Honors

2008-2009 Psychology Department Dissertation Award
2008-2009 University Dissertation Fellowship
2007-2008 Psychology Department Teaching Fellow

Teaching Activities

Instructor

Arduino for Neurobiologists, *Harvard Medical School*, Fall 17, Spring 17, Fall 18, Fall 19, Spring 20.

Freshman Physics Seminar, *Harvard University*, Spring 17.

Sensation and Perception (Psyc 310), *University of Delaware*, Fall 07, Spring 08.

Teaching Assistant

Measurement and Statistics (Psyc 209), *University of Delaware*, Spring 07.

Sensation and Perception (Psyc 310), Lab Instructor, *University of Delaware*, Fall 04 - Spring 07

Sensation and Perception (Psyc 310, online course), *University of Delaware*, Fall 06.

Developmental Psychology (Psyc 350), *University of Delaware*, Fall 06.

Brain and Behavior (Psyc 314), *University of Delaware*, Fall 05.