Brian H. Hu

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Education

Johns Hopkins University, Baltimore, MD

Ph.D., Biomedical Engineering, June 2017 (expected)

- Thesis: *Grouping mechanisms for object-based vision and attention*
- Advisor: Dr. Ernst Niebur

University of Pittsburgh, Pittsburgh, PA

B.S., Bioengineering (Minor in Chemistry), *summa cum laude*, May 2011

- Swanson School of Engineering Outstanding Senior Award
- Department of Bioengineering Outstanding Student of the Year Award

Honors and Awards

OIST Computational Neuroscience Course (OCNC) Travel Award, 2014

Visual Neuroscience Training Program Fellowship, 2012-2013

Neural Engineering Training Initiative Fellowship, 2011-2012

University Honors College Full Tuition Scholarship, 2007-2011

Swanson School of Engineering Honors Scholarship, 2007-2011

Chesapeake and Potomac Pitt Club Alumni Scholarship, 2007-2011

Research Experience

Computational Neuroscience Laboratory, Graduate Research Assistant   June 2012–present

Advisor: Dr. Ernst Niebur (Johns Hopkins University)

Developing models of object-based vision and attention related to 3D surface perception, visual saliency, contour detection, and figure-ground segmentation

Connor Lab, Rotation Student   Jan 2012–Jun 2012

Advisor: Dr. Ed Connor (Johns Hopkins University)

Designed novel visual stimuli used in a behavioral task to test for inferotemporal cortex neurons that code for both object identity and object value

Computer Integrated Interventional Systems Laboratory, Rotation Student   Aug 2011–Jan 2012

Advisor: Dr. Russell Taylor (Johns Hopkins University)

Developed a microcannula system to assess differences in freehand and robot-assisted in vivo retinal vein cannulation in a rabbit animal model

Sensory Motor Integration Laboratory, Undergraduate Research Assistant   Apr 2009–Apr 2011

Advisor: Dr. Aaron Batista (University of Pittsburgh)

Developed an algorithm to detect changes in monkey reach trajectories, which was used to automatically sort reaches and characterize reaction times to visual and vibrotactile stimuli

Publications

Peer-Reviewed Journal Articles

1. **Hu, B.**, Kane-Jackson, R., and Niebur, E. A proto-object based saliency model in three-dimensional space. *Vision Research*, 119:42–49, 2016. doi: 10.1016/j.visres.2015.12.004

Conference Proceedings

2. **Hu, B.**, von der Heydt, R., and Niebur, E. A neural model for perceptual organization of 3D surfaces. In *IEEE CISS-2015 49th Annual Conference on Information Sciences and Systems*, pages 1–6, Baltimore, MD, 2015. IEEE Information Theory Society. doi: 10.1109/CISS.2015.7086906

3. **Hu, B.**, von der Heydt, R., and Niebur, E. Proto-object based contour detection and figure-ground segmentation. In *Cosyne Abstracts 2017*, Salt Lake City, UT, Accepted

4. **Hu, B.**, Johnson-Bey, I., Sharma, M., and Niebur, E. Head movements during visual exploration of natural images in virtual reality. In *IEEE CISS-2017 51st Annual Conference on Information Sciences and Systems*, Baltimore, MD, Submitted

Working Papers

5. **Hu, B.** and Niebur, E. A recurrent neural model for object-based contour integration and figure-ground segregation. *Journal of Computational Neuroscience*, In preparation

Skills

Programming: MATLAB, Python, familiar with C/C++, JAVA, LabVIEW
Other Tools: Git, LaTeX, HTCondor, NEST, Neuron
Operating Systems: Linux, Windows, Mac OS

Professional Service and Activities

Project Mentor, High School/Undergraduate Students, 2014-2016

Teaching Assistant, Modeling and Design (Fall 2013) and Networks (Fall 2014)

Reviewer for *Frontiers in Systems Neuroscience, PLOS ONE, IEEE Transactions on Image Processing, Journal of Cognitive Neuroscience*

Member, Society for Neuroscience, 2013–*present*

Related Coursework

Signals and Systems, Linear Algebra, Dynamical Systems, Probability and Statistics, Methods and Logic in Neuroscience, Models of the Neuron, Theoretical Neuroscience, Applied Statistics and Data Analysis, Statistical Methods for Imaging, Networks, Machine Learning (Coursera.org), Deep Learning (Udacity.com)