

# Joshua T. Vogelstein

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I am currently an Assistant Professor of Biomedical Engineering in the Whiting School of Engineering at Johns Hopkins University, where I co-direct the [NeuroData](http://NeuroData.org) lab, whose mission is to flourish together by extending and fusing statistical machine learning and big data science to address the most important brain science and mental health questions of our time. As of September 2019, according to [Google Scholar](https://scholar.google.com/citations?user=jovo), I have over 4,900 citations and an h-index of 29.

Our website, [neurodata.io](http://neurodata.io), has the most up to date information regarding our team's [publications](#), [talks](#), [posters](#), [awards](#), [press](#), [funding](#), and [blog](#).

## Education

- 2003 – 2009 **Ph.D in Neuroscience**,  
*Johns Hopkins School of Medicine, Supervised by Eric Young,*  
Dissertation: OOPSI: a family of optical spike inference algorithms for inferring neural connectivity from population calcium imaging .
- 2009 – 2009 **M.S. in Applied Mathematics & Statistics**, *Johns Hopkins University.*
- 1998 – 2002 **B.A. in Biomedical Engineering**, *Washington University, St. Louis.*
- 06/08 – 07/08 **Molecular Biology Summer Workshop**, *Smith College, Mass, USA.*
- 07/08 – 07/08 **Advanced Techniques in Molecular Neuroscience**, *Cold Spring Harbor, New York, USA.*
- 06/05 – 07/05 **Imaging Structure and Function of the Nervous System (audited)**, *Cold Spring Harbor, New York, USA.*
- 06/04 – 07/04 **Advanced Course in Computational Neuroscience**, *Obidos, Portugal.*

## Positions Held

### Academic Positions

- 08/14 – now **Assistant Professor**, *Department of Biomedical Engineering, Johns Hopkins University (JHU).*
- 08/14 – now **Core Faculty**, *Institute for Computational Medicine & Center for Imaging Science (CIS).*

### Academic Affiliations

- 09/19 – now **Joint Appointment**, *Department of Biostatistics, Johns Hopkins University (JHU).*
- 10/15 – now **Steering Committee Member & Associate Member**, *Kavli Neuroscience Discovery Institute.*
- 08/15 – now **Joint Appointment**, *Department of Applied Mathematics and Statistics.*
- 08/14 – now **Joint Appointment**, *Department of Neuroscience.*
- 08/14 – now **Joint Appointment**, *Department of Computer Science.*
- 08/14 – now **Assistant Research Faculty**, *Human Language Technology Center of Excellence.*
- 10/12 – now **Affiliated Faculty**, *Institute for Data Intensive Engineering and Sciences.*

## Awards & Honors

- 2014 **F1000 Prime Recommended**, *Vogelstein et al. (2014).*
- 2013 **Spotlight**, *Neural Information Processing Systems (NIPS).*
- 2011 **Trainee Abstract Award**, *Organization for Human Brain Mapping.*
- 2008 **Spotlight**, *Computational and Systems Neuroscience (CoSyNe).*
- 2002 **Dean's List**, *Washington University.*

## Peer-Reviewed Journal Publications

(52 articles published/accepted; top 10 cited 2,944 times; H-index 29)

## Pre-Prints

## Talks

Invited Talks

Other Talks

## Posters

## Current Funding

- 5/17 – 4/20 **Multiscale Generalized Correlation: A Unified Distance-Based Correlation Measure for Dependence Discovery**, *NSF*, Shen (PI) 1712947.
- 7/17 – 6/20 **CRCNS US-German Res Prop: functional computational anatomy of the auditory cortex**, *NIH*, Ratnanather (PI) 1R01DC016784-01.
- 10/16 – 9/20 **What Would Tukey Do?**, *DARPA*, Priebe (PI) FA8750-17-2-0112.
- 9/17 – 8/22 **Sensorimotor processing, decision-making, and internal states: towards a realistic multiscale circuit model of the larval zebrafish brain**, *Harvard University / Prime: NIH*, Engert (PI) 1U19NS104653-01.
- 1/18 – 12/19 **Connectome Coding at the Synaptic Scale**, *Schmidt Sciences*, Vogelstein (PI).
- 11/17 – 10/21 **Lifelong Learning Forests**, *DARPA*, This work is graciously supported by the Defense Advanced Research Projects Agency (DARPA) Lifelong Learning Machines program through contract FA8650-18-2-7834, Vogelstein (PI).
- 11/17 – 10/21 **Continual Learning Across Synapses, Circuits, and Brain Areas**, *DARPA*, This research has been supported by the Lifelong Learning Machines (L2M) program of the Defence Advanced Research Projects Agency (DARPA) via contract number HR0011-18-2-0025, Tolia (PI).
- 7/18 – 6/21 **SemiSynBio: Collaborative Research: YeastOns: Neural Networks Implemented in Communication Yeast Cells**, *NSF*, Shulman (PI).

## Past Funding

- 7/17 – 6/19 **NeuroNex Innovation Award: Towards Automatic Analysis of Multi-Terabyte Cleared Brains**, *NSF*, 16-569 *Neural System Cluster*, Vogelstein (PI) 1707298.
- 5/14 – 2/16 **Scalable Brain Graph Analyses Using Big-Memory, High-IOPS Compute Architectures**, *DARPA (GRAPHs)*, Burns (PI), DARPA-BAA-13-15.
- 3/13 – 1/16 **Computational infrastructure for massive neuroscience image stacks**, *NIH/NSF (BIG-DATA)*, Mitra (PI), 1R01DA036400.
- 2/13 – 9/15 **Endeavor Scientists Training Fellowship**, *Child Mind Institute*, Vogelstein (PI).
- 9/12 – 8/15 **Data Sharing: The EM Open Connectome Project**, *NIH/NIBIB (CRCNS)*, Burns (PI), 1R01EB016411.
- 1/14 – 12/14 **Data Readiness Level**, *Laboratory for Analytic Sciences*, Harer (PI).
- 1/12 – 10/13 **Graph-Based Scalable Analytics for Big Data**, *DARPA (XDATA)*, Andrews (PI), FA8750-12-C-0239.
- 12/09 – 1/13 **National Center for Applied Neuroscience Project**, *NSF*, RJ Vogelstein (PI).

## Mentoring

### Post-Doctoral Fellows

- 08/18 – now **Jesús Arroyo, PhD**, *Post-doctoral Fellow*, CIS, JHU.
- 09/16 – 08/18 **Cencheng Shen, PhD**, *Post-Doctoral Fellow*, CIS, JHU.

05/16 – 06/17 **Leo Duan, PhD**, *Post-doctoral Fellow*, CIS, JHU.  
 06/16 – 07/17 **Guilherme Franca, PhD**, *Post-doctoral Fellow*, CIS, JHU.

### PhD Students

08/19 – now **Michael Powell, MSE**, *PhD advisee*, BME, JHU.  
 06/19 – now **Jaewon Chung, MSE**, *PhD advisee*, BME.  
 08/18 – now **Benjamin Pedigo, MSE**, *PhD advisee*, BME, JHU.  
 08/18 – now **Eric Bridgeford, BSE**, *PhD advisee*, Department of Biostatistics, JHU.  
 08/16 – now **Vikram Chandrashekhar, BSE**, *PhD advisee*, BME, JHU.  
 08/14 – 01/18 **Tyler Tomita, PhD**, BME, JHU.

### Masters Students

05/18 – now **Bijan Varjavand, MS** *advisee*, BME, JHU.  
 05/18 – now **Drishti Mannan, MS** *advisee*, BME, JHU.  
 05/18 – now **Sambit Panda, MS** *advisee*, BME, JHU.  
 08/14 – 06/17 **Greg Kiar, MSE**, BME, JHU.

### Undergraduate Students

08/14 – 08/18 **Eric Bridgeford, BSE**, BME, JHU.  
 08/15 – 08/16 **Albert Lee, BSE**, BME, JHU.  
 06/15 – 12/15 **Ron Boger, BSE**, BME, JHU.  
 05/15 – 05/16 **Jordan Matelsky, BSE**, CS and Neuroscience, JHU.  
 02/15 – 05/16 **Ivan Kuznetsov, BSE**, BME, JHU.

### Summer Interns

06/19 – 08/19 **Kareef Ullah**, *Summer Intern*, BME, JHU.  
 06/19 – 08/19 **Shunan Wu**, *Summer Intern*, BME, JHU.  
 06/19 – 08/19 **Shiyu Sun**, *Summer Intern*, BME, JHU.  
 06/19 – 08/19 **Sander Shulhoff**, *Summer Intern*, BME, JHU.  
 06/19 – 08/19 **Kiki Zhang**, *Summer Intern*, BME, JHU.  
 06/18 – 08/18 **Papa Kobina Van Dyck**, *Summer Intern*, BME, JHU.

## Teaching

Fall 2019 **NeuroData Design I**, EN.580.437, Johns Hopkins University.  
 Spring 2019 **NeuroData Design II**, EN.580.437, Johns Hopkins University.  
 Fall 2018 **NeuroData Design I**, EN.580.437, Johns Hopkins University.  
 Spring 2017 **NeuroData Design II**, EN.580.437, Johns Hopkins University.  
 Fall 2017 **NeuroData Design I**, EN.580.437, Johns Hopkins University.  
 Spring 2016 **Upward Spiral of Science**, EN.580.468, Johns Hopkins University.  
 Fall 2016 **NeuroData Design I**, EN.580.437, Johns Hopkins University.  
 Spring 2015 **Statistical Connectomics**, Johns Hopkins University.  
 Winter 2015 **Statistical Connectomics**, Neuroimaging Specialization, Coursera.  
 Fall 2015 **Introduction to Computational Medicine**, Co-Teaching, Johns Hopkins University.

### Academic Activities

08/18 – now **Director of Biomedical Data Science Focus Area**.  
 05/16 – now **Visiting Scientist**, *Howard Hughes Medical Institute*, Janelia Research Campus.  
 01/11 – now **Co-Founder & Co-Director**, *NeuroData* (formerly *Open Connectome Project*).

## Commercial Experience

- 10/18 – now **Advisory Board**, *Mind-X*.  
 01/17 – now **Co-Founder**, *gigantum*.  
 01/17 – now **Advisory Board**, *PivotalPath*.  
 01/16 – now **Co-Founder**, *d8alab*.

## Previous Experience

- 08/14 – 08/18 **Director of Undergraduate Studies**, *Institute for Computational Medicine*.  
 05/15 – 07/17 **Co-Founder and Faculty Advisor**, *MedHacks*.  
 10/12 – 08/14 **Endeavor Scientist**, *Child Mind Institute*.  
 08/12 – 08/14 **Senior Research Scientist**, *Dept's of Statistical Sciences & Mathematics & Neurobiology*.  
 08/12 – 08/14 **Affiliated Faculty**, *Kenan Institute for Ethics*.  
 Duke University  
 08/12 – 08/14 **Adjunct Faculty**, *Department of Computer Science*.  
 01/11 – 08/12 **Assistant Research Professor**, *Department of Applied Mathematics and Statistics*.  
 12/09 – 01/11 **Post-Doctoral Fellow**, *Department of Applied Mathematics and Statistics*, Supervised by  
 Carey E. Priebe.  
 Johns Hopkins University  
 07/04 – 07/12 **Chief Data Scientist**, *Global Domain Partners, LLC*.  
 06/01 – 09/01 **Research Assistant**, *Prof. Randy O'Reilly, Dept. of Psychology*.  
 University of Colorado  
 06/00 – 09/00 **Clinical Engineer**, *Johns Hopkins Hospital*.  
 06/99 – 08/99 **Research Assistant under Dr. Jeffrey Williams**, *Dept. of Neurosurgery, Johns Hopkins Hospital*.  
 06/98 – 08/98 **Research Assistant under Professor Kathy Cho**, *Dept. of Pathology, Johns Hopkins School of Medicine*.

## Conference and Journal Activities

### Reviewer

Annals of Applied Statistics (AOAS), Bioinformatics, Biophysical Journal, IEEE International Conference on eScience, IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), IEEE Global Conference on Signal and Information Processing (Global-SIP), IEEE Signal Processing Letters, IEEE Transactions on Signal Processing, International Conference on Learning Representations (ICLR), Frontiers in Brain Imaging Methods, Journal of Machine Learning Research (JMLR), Journal of Neurophysiology, Journal of the Royal Statistical Society B (JRSSB), Nature Communications, Nature Methods, Nature Reviews Neuroscience, Network Science, Neural Computation, Neural Information Processing Systems (NIPS), NeuroImage, Neuroinformatics, PLoS One, PLoS Computational Biology, Current Opinion in Neurobiology.

### Editorial Board

**Guest Associate Editor**, *PLoS Computational Biology*.  
**Editor**, *Neurons, Behavior, Data analysis, and Theory*.

## Events

- Summer 2019 **Organizer**, *NeuroData Workshop*, <https://neurodata.devpost.com>.  
 March 2019 **Organizer**, *Neuro Reproducibility Hackashop*, <https://brainx3.io/>.

- Summer 2017 **Organizer**, *NeuroStorm*, <https://brainx2.io>.
- Spring 2016 **Organizer**, *Global Brain Workshop*, <http://brainx.io>.
- Fall 2015 **Co-Organizer**, *BigNeuro2015: Making Sense of Big Neural Data*, *NIPS Workshop*, <http://neurodata.io/bigneuro2015>.
- Winter 2015 **Organizer**, *Hack@NeuroData*, <http://hack.neurodata.io/>.
- 2015 - 2017 **Faculty Supervisor**, *MedHacks*, <http://medhacks.org/>.
- Fall 2012 **Co-Organizer**, *Scaling up EM Connectomics Conference*, <https://openwiki.janelia.org/wiki/download/attachments/8687459/final+agenda+EM+Connectomics+100512.pdf>.

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## Languages

- Proficient **English, Hebrew, Love, MATLAB,  $\text{\LaTeX}$ .**
- Inproficient **R, Python, HTML, CSS.**