Joshua T. Vogelstein

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Academic Experience

Current Positions

08/14 – now **Assistant Professor**, *Department of Biomedical Engineering*, Johns Hopkins University.

08/14 – now **Core Faculty**, *Institute for Computational Medicine & Center for Imaging Science*, Johns Hopkins University.

Current Affiliations

05/16 – now **Visiting Scientist**, *Howard Hughes Medical Institute*, Janelia Research Campus.

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*, Johns Hopkins University.

Current Activities

01/11 – now **Co-Founder & Co-Director**, *NeuroData (formerly Open Connectome Project)*.

08/14 – now **Director of Undergraduate Studies**, *Institute for Computational Medicine*.

05/15 – now **Co-Founder and Faculty Advisor**, *MedHacks*.

Previous Positions

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

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*.

Funding

Pending Funding

1/17 – 10/17 **Tools for Sharing and Analyzing Neuroscience Data**, *$149,730.93*, DARPA (SBIR), Zheng (PI).

5/17 – 4/20 **Multiscale Generalized Correlation: A Unified Distance-Based Correlation Measure for Dependence Discovery**, *$438,567.00*, NSF (Statistics), Shen (PI).

4/17 – 4/18 **NeuroNex Technology Hub: Towards The International Brain Station for Accelerating and Democratizing Neuroscience Data Analysis and Modeling**, *$10,000,000.00, NSF (NeuroNex), Vogelstein (PI), 1649880.*

8/17 – 7/20 **Correspondence Discovery in Disparate Networks with Applications to Brain and Bioinformatics**, *$100,000.00*, NSF (III), Tong (PI).

Current Funding

1/17 – 12/18 **Computational Infrastructure for Brain Research: EAGER: BrainLab CI: Collaborative, Community Experiments with Data-Quality Controls through Continuous Integration**, *NSF*, $97,950, Burns (PI), 1649880.

4/16 – 3/17 **A Scientific Planning Workshop for Coordinating Brain Research Around the Globe**, *$97,950.00*, NSF, Vogelstein (PI).

7/15 – 6/17 **Learning Causes Changes in the State-Space of Local Cortical Networks**, *$53,747.00*, JHU: Science of Learning Institute, Nielsen (PI).

7/15 – 6/17 **Quantifying Individual Differences in Network Dynamics for Abstract Information Learning**, *$53,747.00*, JHU: Science of Learning Institute, Courtney (PI).

5/15 – 5/18 **From Rags to Riches: Utilizing Richly Attributed Graphs**, *$1,975,863.00*, DARPA (SIMPLEX), Vogelstein (PI), N66001-15-C-4041.

9/14 – 6/19 **Synaptomes of Mouse and Man (JHU Subcontract)**, *$940,360.00*, NIH (TRA), Smith (PI), R01 OD19123.

10/12 – 3/17 **Fusion and Inference from Multiple and Massive Infrastructure for Massive Neuroscience**, *DARPA (XDATA)*, Priebe (PI), FA8750-12-2-0303.

7/12 – 6/17 **CLARITY: Full-Assembled Biology**, *NIH (TRA)*, Deisseroth (PI), 1R01MH099647-01.

Past Funding

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 (BIGDATA)*, 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).

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.*

Work Experience

01/16 – now **Co-Founder & Partner**, *d8alab*.

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.*

Under Review

1 G. Kiar, K. J. Gorgolewski, D. Kleissas, W. Gray Roncal, B. Litt, B. Wandell, R. A. Poldrack, M. Wiener, R. Vogelstein, R. Burns, and J. T. Vogelstein. Science In the Cloud (SIC): A use case in MRI Connectomics. 2016.

2 J. T. Vogelstein et al. Grand Challenges for Global Brain Sciences, 2016.

3 R. Tang, M. Ketcha, J. T. Vogelstein, C. E. Priebe, and D. L. Sussman. Law of Large Graphs. 2016.

4 D. Grant Colburn Hildebrand, R. M. Torres, W. Choi, T. M. Quan, A. W. Wetzel, G. S. Plummer, R. Portugues, I. H. Bianco, S. Saalfeld, A. Baden, L. Kunal, R. Burns, J. T. Vogelstein, W.-K. Jeong, J. W. Lichtman, and F. Engert. Whole-brain serial-section electron microscopy in larval zebrafish. 2016.

5 C. Shen, J. T. Vogelstein, and C. E. Priebe. Manifold Matching using Shortest-Path Distance and Joint Neighborhood Selection. *arXiv*, 2016.

6 D. Mhembere, D. Zheng, J. T. Vogelstein, C. E. Priebe, and R. Burns. NUMA-optimized In-memory and Semi-external-memory Parameterized Clustering. 2016.

7 T. Tomia, M. Maggioni, and J. T. Vogelstein. Randomer Forests. *arXiv*, 2016.

8 D. Zheng, R. Burns, J. T. Vogelstein, C. E. Priebe, and A. S. Szalay. An SSD-based eigensolver for spectral analysis on billion-node graphs. *arXiv*, 2016.

9 D. Zheng, D. Mhembere, V. Lyzinski, J. T. Vogelstein, C. E. Priebe, and R. Burns. Semi-External Memory Sparse Matrix Multiplication on Billion-node Graphs in a Multicore Architecture. *arXiv*, 2016.

10 D. Zheng, D. Mhembere, J. T. Vogelstein, C. E. Priebe, and R. Burns. FlashMatrix: Parallel, Scalable Data Analysis with Generalized Matrix Operations using Commodity SSDs. *arXiv*, 1604.06414, 2016.

11 S. Chen, K. Liu, Y. Yang, Y. Xu, S. Lee, M. Lindquist, B. S. Caffo, and J. T. Vogelstein. An M-Estimator for Reduced-Rank High-Dimensional Linear Dynamical System Identification. *arXiv*, 1509.03927, 2015.

12 N. Binkiewicz, J. T. Vogelstein, and K. Rohe. Covariate Assisted Spectral Clustering. *arXiv*, 2014.

13 A. Banerjee, J. Vogelstein, and D. Dunson. Parallel inversion of huge covariance matrices. *arXiv*, 1312.1869:17, 2013.

14 M. Kazhdan, R. Burns, B. Kasthuri, J. Lichtman, J. Vogelstein, and J. Vogelstein. Gradient-Domain Processing for Large EM Image Stacks. *arXiv*, 1310.0041, 2013.

Peer-Reviewed Journal Publications

1 D. Durante, D. B. Dunson, and J. T. Vogelstein. Nonparametric Bayes Modeling of Populations of Networks. *Journal of the American Statistical Association*, 0(ja):0–0, 2016.

2 L. Chen, C. Shen, J. T. Vogelstein, and C. E. Priebe. Robust Vertex Classification. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 38(3):578–590, 2016.

3 R. D. Airan, J. T. Vogelstein, J. J. Pillai, B. Caffo, J. J. Pekar, and H. I. Sair. Factors affecting characterization and localization of interindividual differences in functional connectivity using MRI. *Human Brain Mapping*, 2016.

4 L. Chen, J. T. Vogelstein, V. Lyzinski, and C. E. Priebe. A Joint Graph Inference Case Study: the C. Elegans Chemical and Electrical Connectomes. *Worm*, 2016.

5 K. M. Harris, J. Spacek, M. E. Bell, P. H. Parker, L. F. Lindsey, A. D. Baden, J. T. Vogelstein, and R. Burns. A resource from 3D electron microscopy of hippocampal neuropil for user training and tool development. *Scientific Data*, 2:150046, 2015.

6 R. Airan, J. T. Vogelstein, J. J. Pillai, B. Caffo, J. Pekar, and H. Sair. Stability and localization of inter-individual differences in functional connectivity. *Human Brain Mapping*, 2015.

7 D. Koutra, N. Shah, J. T. Vogelstein, B. Gallagher, and C. Faloutsos. DeltaCon: Principled Massive-Graph Similarity Function with Attribution. *ACM Transactions on Knowledge Discovery from Data*, 10(3):28:1–28:43, February 2016.

8 L. Chen, J. Vogelstein, and C. Priebe. Robust Vertex Classification. *IEEE Pattern Analysis and Machine Intelligence (in press)*, PP:27, 2015.

9 W. G. Roncal, D. M. Kleissas, J. T. Vogelstein, P. Manavalan, R. Burns, R. J. Vogelstein, C. E. Priebe, M. A. Chevillet, and G. D. Hager. An Automated Images-to-Graphs Pipeline for High Resolution Connectomics. *Frontiers in Neuroinformatics*, 9, 2015.

10 N. Kasthuri, K. J. Hayworth, D. R. Berger, R. L. Schalek, J. A. Conchello, S. Knowles-Barley, D. Lee, Vazquez-Reina, V. Kaynig, T. R. Jones, M. Roberts, J. L. Morgan, J. C. Tapia, H. S. Seung, W. G. Roncal, J. T. Vogelstein, R. Burns, D. L. Sussman, C. E. Priebe, H. Pfister, and J. W. Lichtman. Saturated Reconstruction of a Small Volume of Neocortex. *Cell*, 162:648–661, 2015.

11 J. T. Vogelstein, J. M. Conroy, V. Lyzinski, L. J. Podrazik, S. G. Kratzer, E. T. Harley, D. E. Fishkind, R. J. Vogelstein, and C. E. Priebe. Fast Approximate Quadratic Programming for Graph Matching. *PLoS One*, 10:e0121002, 2015.

12 J. T. Vogelstein and C. E. Priebe. Shuffled Graph Classification: Theory and Connectome Applications. *Journal of Classification*, 32:3–20, 2015.

13 V. Lyzinski, D. L. Sussman, D. E. Fishkind, H. Pao, L. Chen, J. T. Vogelstein, Y. Park, and C. E. Priebe. Spectral clustering for divide-and-conquer graph matching. *Parallel Computing*, 47:70–87, 2015.

14 V. Lyzinski, D. E. Fishkind, M. Fiori, J. T. Vogelstein, C. E. Priebe, and G. Sapiro. Graph Matching: Relax at Your Own Risk. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 38(1):60–73, Jan 2016.

15 V. Lyzinski, S. Adali, J. T. Vogelstein, Y. Park, and C. E. Priebe. Seeded Graph Matching Via Joint Optimization of Fidelity and Commensurability. *arXiv*, 1401.3813, 2014.

16 N. C. Weiler, F. Collman, J. T. Vogelstein, R. Burns, and S. J. Smith. Synaptic molecular imaging in spared and deprived columns of mouse barrel cortex with array tomography. *Scientific Data*, 1:140046, 2014.

17 E. M. Sweeney, J. T. Vogelstein, J. L. Cuzzocreo, P. A. Calabresi, D. S. Reich, C. M. Crainiceanu, and R. T. Shinohara. A Comparison of Supervised Machine Learning Algorithms and Feature Vectors for MS Lesion Segmentation Using Multimodal Structural MRI. *PLoS ONE*, 9:e95753, 2014.

18 J. T. Vogelstein, Y. Park, T. Ohyama, R. A. Kerr, J. W. Truman, C. E. Priebe, and M. Zlatic. Discovery of brainwide neural-behavioral maps via multiscale unsupervised structure learning. *Science*, 344(6182):386–92, 2014.

19 D. E. Carlson, J. T. Vogelstein, Q. Wu, W. Lian, M. Zhou, C. R. Stoetzner, D. Kipke, D. Weber, D. B. Dunson, and L. Carin. Multichannel Electrophysiological Spike Sorting via Joint Dictionary Learning & Mixture Modeling. *IEEE Transactions on Biomedical Engineering*, 61(1):41–54, 2014.

20 J. T. Vogelstein, W. R. Gray, R. J. Vogelstein, and C. E. Priebe. Graph classification using signal-subgraphs: applications in statistical connectomics. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 35(7):1539–51, 2013.

21 R. C. Craddock, S. Jbabdi, C.-G. Yan, J. T. Vogelstein, F. X. Castellanos, A. Di Martino, C. Kelly, K. Heberlein, S. Colcombe, and M. P. Milham. Imaging human connectomes at the macroscale. *Nature Methods*, 10(6):524–39, 2013.

22 C. E. Priebe, J. Vogelstein, and D. Bock. Optimizing the Quantity/Quality Trade-Off in Connectome Inference. *Communications in Statistics - Theory and Methods*, 42(19):3455–3462, 2013.

23 D. Dai, H. He, J. T. Vogelstein, and Z. Hou. Accurate prediction of AD patients using cortical thickness networks. *Machine Vision and Applications*, 24(7):1445–1457, 2012.

24 D. E. Fishkind, D. L. Sussman, M. Tang, J. T. Vogelstein, and C. E. Priebe. Consistent Adjacency-Spectral Partitioning for the Stochastic Block Model When the Model Parameters Are Unknown. *SIAM Journal on Matrix Analysis and Applications*, 34(1):23–39, 2013.

25 N. J. Roberts, J. T. Vogelstein, G. Parmigiani, K. W. Kinzler, B. Vogelstein, and V. E. Velculescu. The predictive capacity of personal genome sequencing. *Science Translational Medicine*, 4(133):133ra58, 2012.

26 W. R. Gray, J. A. Bogovic, J. T. Vogelstein, B. A. Landman, J. L. Prince, and R. J. Vogelstein. Magnetic resonance connectome automated pipeline: an overview. *IEEE Pulse*, 3(2):42–8, 2012.

27 J. T. Vogelstein, R. J. Vogelstein, and C. E. Priebe. Are mental properties supervenient on brain properties? *Scientific Reports*, 1:100, 2011.

28 S. B. Hofer, H. Ko, B. Pichler, J. Vogelstein, H. Ros, H. Zeng, E. Lein, N. A. Lesica, and T. D. Mrsic-Flogel. Differential connectivity and response dynamics of excitatory and inhibitory neurons in visual cortex. *Nature Neuroscience*, 14(8):1045–52, 2011.

29 Y. Mishchenko, J. T. Vogelstein, and L. Paninski. A Bayesian approach for inferring neuronal connectivity from calcium fluorescent imaging data. *The Annals of Applied Statistics*, 5(2B):1229–1261, 2011.

30 J. T. Vogelstein, A. M. Packer, T. A. Machado, T. Sippy, B. Babadi, R. Yuste, and L. Paninski. Fast nonnegative deconvolution for spike train inference from population calcium imaging. *Journal of Neurophysiology*, 104(6):3691–704, 2010.

31 L. Paninski, Y. Ahmadian, D. G. Ferreira, S. Koyama, K. R. Rad, M. Vidne, J. Vogelstein, and W. Wu. A new look at State-Space Models for Neural Data. *Journal of Computational Neuroscience*, 29(1-2):107–26, 2010.

32 J. T. Vogelstein, B. O. Watson, A. M. Packer, R. Yuste, B. Jedynak, and L. Paninski. Spike inference from calcium imaging using sequential Monte Carlo methods. *Biophysical Journal*, 97(2):636–55, 2009.

33 R. J. Vogelstein, U. Mallik, J. T. Vogelstein, and G. Cauwenberghs. Dynamically reconfigurable silicon array of spiking neurons with conductance-based synapses. *IEEE Transactions on Neural Networks*, 18(1):253–65, 2007.

34 J. T. Vogelstein, D. Angelaki, and L. Snyder. Accuracy of saccades to remembered targets as a function of body orientation in space. *Journal of Neurophysiology*, 90(1):521–4, 2003.

35 D. L. Greenspan, D. C. Connolly, R. Wu, R. Y. Lei, J. T. Vogelstein, Y. T. Kim, J. E. Mok, N. Muñoz, F. X. Bosch, K. Shah, and K. R. Cho. Loss of FHIT expression in cervical carcinoma cell lines and primary tumors. *Cancer research*, 57(21):4692–8, 1997.

Peer-Reviewed Conference Proceedings

1 K. S. Kutten, J. T. Vogelstein, N. Charon, L. Ye, K. Deisseroth, and M. I. Miller. Deformably Registering and Annotating Whole CLARITY Brains to an Atlas via Masked LDDMM. *SPIE Europe*, 2016.

2 W. Gray Roncal, M. Pekala, V. Kaynig-fittkau, D. M. Kleissas, J. T. Vogelstein, H. Pfister, R. Burns, R. J. Vogelstein, M. A. Chevillet, and G. D. Hager. VESICLE : Volumetric Evaluation of Synaptic Inferfaces using Computer vision at Large Scale. In *26th British Machine Vision Conference (BMVC)*, pages 1–9, 2015.

3 D. Zheng, D. Mhembere, R. Burns, J. T. Vogenstein, C. E. Priebe, and A. S. Szalay. FlashGraph: Processing Billion-Node Graphs on an Array of Commodity SSDs. In *USENIX Conference on File and Storage Technologies*, 2015.

4 F. Petralia, J. T. Vogelstein, and D. Dunson. Multiscale Dictionary Learning for Estimating Conditional Distributions. *Advances in Neural Information Processing Systems (NIPS)*, pages 1797–1805, 2013.

5 D. Carlson, V. Rao, J. T. Vogelstein, and L. Carin. Real-Time Inference for a Gamma Process Model of Neural Spiking. *Advances in Neural Information Processing Systems (NIPS)*, pages 2805–2813, 2013.

6 M. Fiori, P. Sprechmann, J. Vogelstein, P. Muse, and G. Sapiro. Robust Multimodal Graph Matching: Sparse Coding Meets Graph Matching. *Advances in Neural Information Processing Systems (NIPS)*, pages 127–135, 2013. (spotlight).

7 D. Koutra, J. T. Vogelstein, and C. Faloutsos. DeltaCon: A Principled Massive-Graph Similarity Function. *Proceedings of the 2013 SIAM International Conference on Data Mining*, pages 162–170, 2013.

8 W. G. Roncal, Z. H. Koterba, D. Mhembere, D. M. Kleissas, J. T. Vogelstein, R. Burns, A. R. Bowles, D. K. Donavos, S. Ryman, R. E. Jung, L. Wu, V. Calhoun, and R. J. Vogelstein. MIGRAINE: MRI Graph Reliability Analysis and Inference for Connectomics. *IEE GlobalSIP*, 2013.

9 D. Mhembere, W. G. Roncal, D. Sussman, C. E. Priebe, R. Jung, S. Ryman, R. J. Vogelstein, J. T. Vogelstein, and R. Burns. Computing Scalable Multivariate Global Invariants of Large (Brain-) Graphs. *IEE GlobalSIP*, 2013.

10 V. Kulkarni, J. Sastry, J. T. Vogelstein, and L. Akoglu. Sex Differences in the Human Connectome. In *International Conference on Brain and Health Informatics*, 2013. Lecture Notes in Computer Science, Volume 8211.

11 R. Burns, W. G. Roncal, D. Kleissas, K. Lillaney, P. Manavalan, E. Perlman, D. R. Berger, D. D. Bock, K. Chung, L. Grosenick, N. Kasthuri, N. C. Weiler, K. Deisseroth, M. Kazhdan,

J. Lichtman, R. C. Reid, S. J. Smith, A. S. Szalay, J. T. Vogelstein, and R. J. Vogelstein. The Open Connectome Project Data Cluster: Scalable Analysis and Vision for High-Throughput Neuroscience. *Proceedings of the 25th International Conference on Scientific and Statistical Database Management (SSDBM)*. Article No. 27, 2013.

12 B. Cornelis, Y. Yang, J. T. Vogelstein, A. Dooms, I. Daubechies, and D. Dunson. Bayesian crack detection in ultra high resolution multimodal images of paintings. *DSP 2013 Special Session on Tensor Factorization and its Applications*, 2013.

13 Q. J. Huys, J. Vogelstein, and P. Dayan. Psychiatry: Insights into depression through normative decision-making models. *Advances in Neural Information Processing Systems (NIPS)*, pages 729–736, 2008.

Other Publications

1 J. T. Vogelstein, B. Mensh, M. Häusser, N. Spruston, A. C. Evans, K. Kording, K. Amunts, C. Ebell, J. Muller, M. Telefont, S. Hill, S. P. Koushika, C. Calì, P. A. Valdés-Sosa, P. B. Littlewood, C. Koch, S. Saalfeld, A. Kepecs, H. Peng, Y. O. Halchenko, G. Kiar, M.-M. Poo, J.-B. Poline, M. P. Milham, A. P. Schaffer, R. Gidron, H. Okano, V. D. Calhoun, M. Chun, D. M. Kleissas, R. J. Vogelstein, E. Perlman, R. Burns, R. Huganir, and M. I. Miller. To the Cloud! A Grassroots Proposal to Accelerate Brain Science Discovery. *Neuron*, 92(3):622–627, Nov 2016.

2 P. Golland, J. Galland, G. Hager, H. Pfister, P. Christos, S. Schaal, and J. T. Vogelstein. A New Age of Computing and the Brain. In CCC Brain Workshop, 2015.

3 R. Burns, J. T. Vogelstein, and A. S. Szalay. From cosmos to connectomes: the evolution of data-intensive science. *Neuron*, 83(6):1249–52, 2014.

4 R. Yuste, J. MacLean, J. Vogelstein, and L. Paninski. Imaging action potentials with calcium indicators. *Cold Spring Harbor Protocols*, 2011(8):985–9, 2011.

5 J. T. Vogelstein. Q&A: What is the Open Connectome Project? *Neural Systems & Circuits*, 1:16, 2011.

6 J. T. Vogelstein, R. J. Vogelstein, and B. Vogelstein. Testing the effects of genetic variations using MINIME technology. *Science*, 286:2300–2301, 1999.

Work in Progress – Pre-prints Available upon Request

1 Robust Bayesian Inference via Lq-Likelihood. Joint work with D.B. Dunson, Carey E. Priebe, Y. Qin.

2 Optimal Subspace Projection for High-Dimensional Classiciation and Testing. Joint work with M. Maggioni.

3 Neuronal Classification from Network Connectivity. Joint work with R. Goldin, D. Marchette, P. Salomonsky, Carey E. Priebe, G. Ascoli.

4 Class Morphing. Joint work with D. Marchette, Carey E. Priebe.

5 Optimal Spike Inference from in vivo 2-Photon Calcium Imaging. Joint work with D. Greenberg, J. Kerr.

6 Extracting Priximity for Brain Graph Voxel Classification. Joint work with N. Sismanis, D.L. Sussman, X. Sun, N. Pitsianis.

Unpublished Work

1 A Six Degree-Of-Freedom Two-Photon Microscope for Functional Imaging in Awake Behaving Primates. Joint work with C.E. Connor et al.

2 A Spiking Model of Ventral Cochlear Nucleus in Response to Complex Stimuli, 2004. Joint work with E. Young.

3 A Hardware Emulator of Awake Behaving Macaque Primary Motor Cortex, 2003. Joing work with D. Moran.

Invited Talks

1 *NeuroData: Enabling Terascale Neuroscience for Everyone*, Keystone Symposia: State of the Brain, 2016.

2 From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from Heterogeneous Data: Part 1. DARPA SIMPLEX PI Meeting, 2015.

3 *Special Symposium: Neuroscience in the 21st Century*, Kavli, 2015.

4 *Open Connectome Project: Lowering the Barrier to Entry of Big Data Neuroscience*, Institute for Computational Medicine at Johns Hopkins University, 2015.

5 *Law of Large Graphs*, DARPA Graphs, 2015.

6 *From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from Heterogeneous Data*, SIMPLEX Kickoff, 2015.

7 *Opportunities and Challenges in Big Data Neuroscience*, DoE, 2015.

8 *Open-Science Platform for Heterogeneous Brain Data: Opportunities and Challenges*, Kavli, 2014.

9 *Top Challenges of Big Data Neuroscience*, BRAIN Initiative Workshop, Dec 2014.

10 *Big Statistics for Brain Sciences*, Baylor College of Medicine, Department of Neuroscience, May 2014.

11 *Big (Neuro) Statistics*, Kavli Salon, 2014. Big Data: Practice Across Disciplines.

12 *Statistical Models and Inference for big Brain-Graphs*, NIPS Workshop on Acquiring and analyzing the activity of large neural ensembles, 2013.

13 *Beyond Little Neuroscience*, Beyond Optogenetics workshop at Cosyne, 2013.

14 *Statistical Inference on Graphs*, University of Michigan, 2013.

15 *Statistical Inference on Graphs*, Scientific Computing Institute, University of Utah, 2013.

16 *Open Problems in Neuropsychiatry*, Data Seminar, Duke University, 2013.

17 *BIG NEURO*, Theory and Neurobiology, Duke University, 2012.

18 *Open Connectome Project*, Academic Medical Center, Amsterdam, 2012.

19 *Connectome Classification: Statistical Graph Theoretic Methods for Analysis of MR-Connectome Data*, Organization for Human Brain Mapping, 2011.

20 *Decision Theoretic Approach to Statistical Inference*, guest Lecture in Current Topics in Machine Learning, Johns Hopkins University, 2012.

21 NIPS workshop on Philosophy and Machine Learning. *Are mental properties supervenient on brain properties*, 2011.

22 *Once we get connectomes, what the %#* are we going to do with them?*, Krasnow Institute for Advanced Study at George Mason Univeristy, 2011.

23 *What can Translational neuroimaging Research do for Clinical Practice*, Child Mind Institute, 2011.

24 *Consistent Graph Classification*, Guest Lecture in Deisseroth Lab, Stanford University, 2011.

25 *Once we get connectomes, what the %#* are we going to do with them?*, Institute of Neuroinformatics, 2011.

26 *Consistent Connectome Classification*, Math/Bio Seminar, Duke University, 2011.

27 *Statistical Connectomics*, Harvard University Connectomics Labs, 2011.

28 *Towards Inference and Analaysis of Neural Circuits Inferred from Population Calcium Imaging*, Guest Lecture in Schnitzer Lab, 2009.

29 *Towards Inferring Neural Circuits from Calcium Imaging*, Guest Lecture in Yuste Lab, 2009.

30 *Neurocognitive Graph Theory*, national Security Agency, 2009.

31 *Sequential Monte Carlo in Neuroscience*, SAMSI Program on Sequential Monte Carlo, Tracking Working Group, 2009.

32 *OOPSI: A Family of Optimal OPtical Spike Inference Algorithms for Inferring Neural Connectivity from Population Calcium Imaging*, Dissertation Defense, 2009.

33 *Inferring Spike Trains Given Calcium-Sensitive Fluorescence Observations*, Statistical Analysis of Neural Data, 2008.

34 *Inferring spike times given typical time-series fluorescence observations*, Department of Applied Mathematics and Statistics, Johns Hopkins University, 2008.

35 *Inferring spike trains from Calcium Imaging*, Redwood Center for Theoretical Neuroscience, University of California, Berkeley, 2008.

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Poster Presentations

1 J. T. Vogelstein. NeuroData: Enabling Terascale Neuroscience for Everyone. In *Janelia: High-Resolution Circuit Reconstruction*, 2016.

2 S. Chen, J. T. Vogelstein, S. Lee, M. Lindquist, and B. Caffo. High Dimensional State Space Model with L-1 and L-2 Penalties. In *ENAR 2015*.

3 J. T. Vogenstein and C. E. Priebe. Nonparametric Two-Sample Testing on Graph-Valued Data. In *Duke Workshop on Sensing and Analysis of HighDimensional Data*, 2013.

4 Y. Qin et al. Robust Clustering of Adjacency Spectral Embeddings of Brain Graph Data via Lq-Likelihood. In *OHBM*, 2013.

5 D. Koutra et al. Are All Brains Wired Equally? In *OHBM*, 2013.

6 D. Sussman et al. Massive Diffusion MRI Graph Structure Preserves Spatial Information. In *OHBM*, 2013.

7 D. Mhembere et al. Multivariate Invariants from Massive Brain-Graphs. In *OHBM*, 2013.

8 W. R. Gray et al. Towards a Fully Automatic Pipeline for Connectome Estimation from High-Resolution EM Data. In *OHBM*, 2013.

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11 J. T. Vogelstein et al. Anomaly Screening and Clustering of Multi-OBject Movies via Multiscale Structure Learning. In *DARPA XDATA Colloquium*, 2013.

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23 J. T. Vogelstein, C. E. Priebe, R. Burns, R. J. Vogelstein, and J. Lichtman. Measuring and reconstructing the brain at the synaptic scale: towards a biofidelic human brain in silico. In *DARPA Neural Engineeering, Science and Technology Forum*, 2010.

24 W. R. Gray, J. T. Vogelstein, J. Bogovic, A. Carass, J. L. Prince, B. Landman, D. Pham, L. Ferrucci, S. M. Resnick, C. E. Priebe, and R. J. Vogelstein. Graph-Theoretical Methods for Statistical Inference on MR Connectome Data. In *DARPA Neural Engineering, Science and Technology Forum*, 2010.

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26 J. T. Vogelstein, R. Vogelstein, and C. E. Priebe. A Neurocognitive Graph-Theoretical Approach to Understanding the Relationship Between Minds and Brains. In *CSHL conference on Neural Circuits*, 2010.

27 J. T. Vogelstein, Y. Mishchenki, A. Packer, T. Machado, R. Yuste, and L. Paninski. Towards Confirming Neural Circuit Inference from Population Calcium Imaging. In *COSYNE*, 2010.

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33 J. T. Vogelstein and L. Paninski. In *Statistical and Applied Mathematical Sciences Institute (SAMSI) Program on Sequential Monte Carlo Methods*.

34 B. Vogelstein, Joshua T Babadi and L. Paninski. Model-Based Optimal Inference of Spike-Times and Calcium Dynamics given Noisy and Intermittent Calcium-Fluorescence Imaging. In *COSYNE*, 2008.

35 J. T. Vogenstein and L. Paninski. Inferring Spike Trains, Learning Tuning Curves, and Estimating Connectivity from Calcium Imaging. In *Integrative Approaches to Brain Complexity*, 2008.

36 J. T. Vogelstein, B. Jedynak, K. Zhang, and L. Paninski. Inferring Spike Trains, Neural Filters, and Network Circuits from in vivo Calcium Imaging. In *Society for Neuroscience*, 2007.

37 J. T. Vogelstein, K. Zhang, B. Jedynak, and L. Paninski. Maximum Likelihood Inference of Neural Dynamics under Noisy and Intermittent Observations using Sequential Monnte Carlo EM Algorithms. In *COSYNE*, 2007.

38 J. T. Vogelstein and K. Zhang. A novel theory for simultaneous representation of multiple dynamic states in hippocampus. In *Society for Neuroscience*, 2004.

39 J. T. Vogelstein, L. Snyder, M. Warchol, and D. Angelaki. Up-down asymmetry in memory guided saccadic eye movements are independent of head orientation in space. In *Society for Neuroscience*, 2002.

Teaching

Spring 2016 **Upward Spiral of Science**, *EN.580.468*, Johns Hopkins University.

Winter 2015 **Statistical Connectomics**, Neuroimaging Specialization, Coursera.

Spring 2015 **Statistical Connectomics**, Johns Hopkins University.

Fall 2015 **Introduction to Computational Medicine**, Co-Teaching, Johns Hopkins University.

Advising

Current Advisees

02/16 – now **Jesse Leigh Patsolic**, *Assistant Research Engineer*, Center for Imaging Science, The Johns Hopkins University.

08/15 – now **Albert Lee**, *BS candidate*, BME.

08/14 – now **Greg Kiar**, *Neuro-Cartographer*, Center for Imaging Science, The Johns Hopkins University.

08/14 – now **Tyler Tomita**, *PhD candidate*, BME.
08/14 – now **Eric Bridgeford**, *BS candidate*, BME.

Past Advisees

06/15 – 12/15 **Ron Boger**, *BS candidate*, BME.
05/15 – 05/16 **Jordan Matelsky**, *BS*, CS and Neuroscience.
02/15 – 05/16 **Ivan Kuznetsov**, *BS*, BME.
08/14 – 05/16 **Greg Kiar**, *MS*, BME.

Conference and Journal Activities

Reviewer

Nature Communications.
Annals of Applied Statistics (AOAS).
Biophysical Journal.
IEEE 12th International Conference on eScience.
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP).
IEEE Global Conference on Signal and Information Processing (GlobalSIP).
IEEE Signal Processing Letters.
IEEE Transactions on Signal Processing.
Frontiers in Brain Imaging Methods.
Journal of Machine Learning Research (JMLR).
Journal of Neurophysiology.
Journal of the Royal Statistical Society B (JRSSB).
Nature Methods.
Neural Computation.
Neural Information Processing Systems.
NeuroImage.
Neuroinformatics.
Nature Reviews Neuroscience.
PLoS One.
PLoS Computational Biology.

Organizer

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/.
Fall 2015 **Co-Organizer**, *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.

Languages

Proficient **English, Hebrew, Love, MATLAB, LaTeX**.
Inproficient **R, Python, HTML, CSS**.