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dept's of mathematics and statistical science, duke university

Joshua T. Vogelstein   Information Initiative at Duke
Senior Research Scientist   Campus Box 90984
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professional experience

- 2013 to present: Senior Research Scientist, Dept's of Statistical Science & Mathematics, Duke University.
- 2012 to 2013: Visiting Assistant Research Professor, Dept. of Mathematics, Duke University.
- 2011 to 2012: Assistant Research Scientist, Dept. of Applied Mathematics and Statistics, Johns Hopkins University.
- 2010 to 2011: Postdoctoral Fellow under Professor Carey E Priebe, Dept. of Applied Mathematics and Statistics, Johns Hopkins University.

education

- Ph.D. Neuroscience, Johns Hopkins School of Medicine, 2003-2009. dissertation.
- M.S. Applied Mathematics & Statistics, Johns Hopkins University, 2009.
- B.S. Biomedical Engineering, Washington University in St. Louis, 1998-2002.

funding: download current & pending

current funding

1. R01 OD019123 (Smith) | 8/1/2013 – 7/31/2019 | 3.00 calendar
   NIH (Director's Transformative Research Award); Prime: Stanford | $278,510 (Duke Subcontract)
   Title: Synaptomes of Mouse and Man
   The major goals of this project are to discovery the synaptic diversity and complexity in mammalian brains, specifically comparing and contrasting humans with mice, the leading experimental animal.
2. GRANT11551224 (Vogelstein) | 1/1/2014 – 6/30/2015 | 3.00 calendar
   DARPA (GRAPHS) | $278,976
   Title: Scalable Brain Graph Analyses Using Big-Memory, High-IOPS Compute Architectures

The major goals of this project are to design, implement, and deploy graph analytics on heterogeneous hardware for the analysis of human (and other) brain graphs.

3. Data Readiness Level (Harer) | 1/1/2014 – 12/31/2014 | N/A
LAS | $50,000
Title: Data Readiness Level
The major goals of this project are to methods that can assess the value of a piece of data at any particular point in the analytic process.

4. 1R01EB016411 (Burns) | 9/10/2012 – 8/31/2015 | 3.00 calendar
NIH (CRCNS) | $207,077
Title: The EM Open Connectome Project
The major goals of this project are to develop open-source software and publicly accessible infrastructures for the neuroscience community to collect, curate, and analyze electron microscopy (EM) connectomes.

5. 1R01DA036400 (Mitra) | 3/15/2013 – 1/31/2015 | 0.50 calendar
NIH (BIGDATA); Prime: CSHL | $94,173 (JHU Subcontract)
Title: Computational Infrastructure for Massive Neuroscience
The major goals of this project are to develop a data-intensive architecture for the management and analysis of massive mouse brain imaging datasets

6. FA8750-12-2-0303 (Priebe) | 9/10/2012 – 3/9/2017 | 0.00 calendar
DARPA (XDATA) | $125,000
Title: Fusion and Inference from Multiple and Massive Disparate Distributed Dynamic Data Sets
The major goals of this project are to develop and extend rigorous statistical theory and practice to perform various inferential tasks when the data are massive, distributed, and dynamic.

7. 1R01MH099647-01 (Deisseroth) | 7/01/2012 – 6/30/2017 | N/A
NIH (TR01); Prime: Stanford | $30,000
Title: CLARITY: Fully-Assembled Biology
The major goals of this project are to develop technology to enable peering into the structural and activity connectomes of nearly intact neural circuits.

8. N/A (Vogelstein) | 2/11/2013 – 2/11/2015 | N/A
Child Mind Institute | $75,000
Title: Endeavor Scientists Training Fellowship
The major goals of this project are to analyze MR derived brain imaging data using rigorous statistical methods.

pending funding

1. 1423272 (Guyon; CMU) | 7/1/2014 – 6/30/2017 | N/A
NSF (IIS) | $20,000
Title: Machine Learning Coopetitions
The major goals of this project are to develop technology to enable peering into the structural and activity connectomes of nearly intact neural circuits.

2. R01MH103295 (Craddock) | 9/1/2014 – 8/31/2018 | 1.20 calendar
NIH/NIMH; Prime: Child Mind Institute | $90,398 (JHU Subcontract)
Title: The Preprocessing Connectomes Project: An open science data analysis initiative
The major goals of this project are to derive the canonical pre-processed connectomics statistical methods and data from extant datasets.

3. 1U01MH105993-01 (Kasthuri) | 9/1/2014 – 8/31/2018 | 1.52 calendar
NIH/NIMH (BRAIN); Prime: BU | $230,000 (JHU Subcontract)

Title: A Rosetta Stone for Cell Type Comparisons between Mice, Macque, and Human Brains.
The major goals of this project are to derive the canonical pre-processed connectomics statistical methods and data from extant datasets.

past funding

1. 964165 (RJ Vogelstein) | 12/16/09 – 1/14/13 | 10.00 calendar
   NSF | $98,700
   Title: National Center for Applied Neuroscience Project (NCAN)
   The major goals of this project are to develop statistical methodologies with translational impact in neuroscience.
2. FA8750-12-C-0239 (Andrews) | 11/8/2012 – 10/31/2013 | N/A
   DARPA (XDATA); Prime: BBN | $10,000 (JHU Subcontract)
   Title: Graph-Based Scalable Analytics for Big Data
   The major goals of this project are to derive scalable analytics for graph data.

reviewing

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

publications

refereed journal publications [(manuscripts)](manuscripts)

1. EM Sweeney, **JT Vogelstein**, JL Cuzzocreco, PA Calabresi, DS Reich, CM Crainiceanu, RT Shinohara. *Using a canon to kill a mosquito: a comparison of machine learning techniques in the context of MS lesion segmentation in structural MRI.* PLoS One. 9, 4 (2014). article. DOI: 10.1371/journal.pone.0095753
2. **JT Vogelstein**, Y Park, T Ohyama, R Kerr, JW Truman, CE Priebe, M Zlatic. *Discovery of Brainwide Neural-Behavioral Maps via Multiscale Unsupervised Structure Learning.* Science. 344, 286 (2014). website, abstract, [pdf](pdf), reuters, code, data, DOI: 10.1126/science.1250298.
3. **JT Vogelstein**, CE Priebe. *Shuffled Graph Classification: Theory and Applications in*

Statistical Connectomics. In press at Journal of Classification, arxiv, code.

4. D Carlson, **JT Vogelstein**, Q Wu, W Lian, M Zhou, CR Stoetzner, D Kipke, D Weber, D Dunson, L Carin. *Sorting Electrophysiological Data via Dictionary Learning & Mixture Modeling*. IEEE Transactions on Biomedical Engineering. Volume 61, Number 1, pages 41-54 (2014). doi: 10.1109/TBME.2013.2275751. arxiv, article.

5. **JT Vogelstein**, WR Gray, RJ Vogelstein, CE Priebe. *Graph Classification using Signal Subgraphs: Applications in Statistical Connectomics*. IEEE TPAMI, vol. 35, no. 7, pp. 1539-1551, July 2013. arxiv, code, repo, article.

6. RC Craddock, S Jbabdi, C-G Yan, **JT Vogelstein**, FX Castellanos, A Di Martino, C Kelly, K Heberlein, S Colcombe, MP Milham. *Imaging human connectomes at the macroscale*. Nat Methods. Jun;10(6):524-39. 2013. doi: 10.1038/nmeth.2482. PMID 23722212. abstract, pdf.

7. CE Priebe, **JT Vogelstein**, D Bock. *Optimizing the Quantity/Quality Trade-Off in Connectome Inference*. Communications in Statistics---Theory and Methods. Volume42, Issue 19 (2013). abstract, arvix.

8. D Dai, H He, **JT Vogelstein**, Z Hou. *Accurate prediction of AD patients using cortical thickness networks*. Machine Vision and Applications (2013) 24:1445-1457. doi:10.1007/s00138-012-0462-0. article.

9. Fishkind DE, Sussman DL, Tang M, **Vogelstein JT**, Priebe CE. *Consistent adjacency-spectral partitioning for the stochastic block model when the model parameters are unknown*. SIAM Journal of Matrix Analysis and Applications, 34(1), 23–39. 2012. article, arxiv.

10. Roberts NJ*, **Vogelstein JT***, Parmigiani G, Kinzler KW, Vogelstein B, Velculescu VE. The Predictive Capacity of Personal Genome Sequencing. *Science Translational Medicine*, 2012 May 9;4(133):133ra58. abstract, pdf.

11. WR Gray, JA Bogovic, **JT Vogelstein**, BA Landman, JL Prince, RJ Vogelstein. *MR Connectome Automated Pipeline*. *IEEE EMBS*, Volume 3, Issue 2 (2012), 42-48. arxiv, code, abstract, pdf.

12. **JT Vogelstein**, RJ Vogelstein, CE Priebe. *Are mental properties supervenient on brain properties?* . Nature Scientific Reports, (1):100, 2011. article.

13. SB Hofer, Ho Ko, B Pichler, **JT Vogelstein**, H Ros, H Zend, E Lein, NA Lesica, TD Mrsic-Flogel. *Differential tuning and population dynamics of excitatory and inhibitory neurons reflect differences in local intracortical connectivity*. abstract, pdf (including supp). Nature Neuroscience, 2011.

14. Mishchenko Y, **Vogelstein JT**, Paninski L. *A Bayesian approach for inferring neuronal connectivity from calcium fluorescent imaging data*. Annals of Applied Statistics, Volume 5, Number 2B (2011), 1229-1261. abstract, pdf, repo.

15. **Vogelstein JT**, Packer AM, Machado TA, Sippy T, Babadi B, Yuste R, Paninski L. Fast non-negative deconvolution for spike train inference from population calcium imaging. J Neurophys, 104:3691-3704, 2010. article, code.

16. Paninski L, Ahmadian Y, Ferreira D, Koyama S, Rahnama Rad K, Vidne M, **Vogelstein JT**, Wu W. A new look at state-space models for neural data. Journal of Computational Neuroscience, 2009. article.

17. **Vogelstein JT**, Watson BO, Packer AM, Jedynak B, Yuste R, Paninski L. Spike inference from calcium imaging using sequential Monte Carlo methods. Biophysical Journal, 2009. article, code.

18. Vogelstein RJ, Mallik K, **Vogelstein JT**, Cauwenberghs G. Dynamically Reconfigurable Silicon Array of Integrate-and-Fire Neurons with Conductance-Based Synapses. IEEE Transactions on Neural Networks, 18(1):253-65, 2007. article.

19. **Vogelstein JT**, Angelaki D, Snyder L. Accuracy of saccades to remembered targets depends on body orientation in space. J Neurophys, 90(1):521-4, 2003. article.

20. Greenspan DL, Connolly DC, Wu R, Lei RY, **Vogelstein JT**, Kim YT, Mok JE, Munoz N, Bosch FX, Shah K, Cho KR. Loss of FHIT expression in cervical carcinoma cell lines and primary tumors. Cancer Research, 57(21):4692-8, 1999. article.

accepted pending revisions journal manuscripts

1. NC Weiler, FC Collman, **JT Vogelstein**, R Burns, SJ Smith. *Molecular architecture of barrel synapses following experience dependent plasticity* . Accepted pending revisions at Nature Scientific Data.
2. CE Priebe, DL Sussman, M Tang, **JT Vogelstein**. *Statistical inference on errorfully observed graphs*. Accepted pending revisions at JASA. arxiv.

under review journal manuscripts and pre-prints

1. W Gray Roncal, et al. *Volumetric Exploitation of Synaptic Information using Context Localization and Evaluation*. arxiv.
2. R Airan, **JT Vogelstein**, JJ Pillai, B Caffo, J Pekar, H Sair. *Stability and localization of inter-individual differences in functional connectivity*. Submitted to Neuroimage.
3. V Lyzinski, S Adali, **JT Vogelstein**, Y Park, CE Priebe. *Seeded Graph Matching Via Joint Optimization of Fidelity and Commensurability*. Submitted to Journal of Classification. arxiv, code.
4. V Lyzinski, DL Sussman, DE Fishkind, H Pao, **JT Vogelstein**, CE Priebe. *Seeded graph matching for large stochastic block model graphs*. Submitted to JMLR. arxiv.
5. A Banerjee, **JT Vogelstein**, D Dunson. *Parallel Inversion of huge covariance matrices*. arxiv. Submitted to ????.
6. L Chen, **JT Vogelstein**, CE Priebe. *Robust Vertex Classification*. Submitted to IEEE PAMI. arxiv.
7. M Kazhdan, R Burns, B Kasthuri, J Lichtman, RJ Vogelstein, **JT Vogelstein**. *Gradient-Domain Processing for Large EM Image Stacks*. Submitted to IEEE Transactions on Visualization and Computer Graphics. arxiv.
8. **JT Vogelstein**, JM Conroy, LJ Podrazik, SG Kratzer, ET Harley, DE Fishkind, RJ Vogelstein, CE Priebe. *Fast Approximate Quadratic Programming for Large (Brain) Graph Matching*. Submitted to Computational Statistics & Data Analysis. arxiv, code.

refereed conference proceedings (manuscripts)

1. F Petralia, **JT Vogelstein**, D Dunson. *Multiscale Dictionary Learning for Estimating Conditional Distributions*. Neural Information Processing Systems (NIPS), 2013. manuscript.
2. D Carlson, V Rao, **JT Vogelstein**, L Carin. *Real-Time Inference for a Gamma Process Model of Neural Spiking*. Neural Information Processing Systems (NIPS), 2013. manuscript, code.
3. M Fiori, P Sprechmann, **JT Vogelstein**, P Muse, G Sapiro. *Robust Multimodal Graph Matching: Sparse Coding Meets Graph Matching*. Neural Information Processing Systems (NIPS), 2013 (spotlight). nips, arxiv, code.
4. W Gray Roncal, ZH Koterba, D Mhembere, DM Kleissas, JT Vogelstein, R Burns, AR Bowles, DK Donavos, S Ryman, RE Jung, L Wu, V Calhoun, RJ Vogelstein. *MIGRAINE: MRI Graph Reliability Analysis and Inference for Connectomics*. GlobalSIP, 2013. arxiv.
5. D Mhembere, W Gray Roncal, D Sussman, CE Priebe, R Jung, S Ryman, RJ

Vogelstein, **JT Vogelstein**, R Burns. *Computing Scalable Multivariate Glocal Invariants of Large (Brain-) Graphs*. GlobalSIP, 2013. arxiv, code.

6. V Kulkarni, J Sastry, **JT Vogelstein**, L Akoglu. *Sex Differences in the Human Connectome*. International Conference on Brain and Health Informatics (BHI, 2013), Lecture Notes in Computer Science, Volume 8211. pdf.

7. R Burns, W Gray Roncal, D Kleissas, K Lillaney, P Manavalan, E Perlman, DR Berger, DD Bock, K Chung, L Grosenick, N Kasthuri, NC Weiler, K Deisseroth, M Kazhdan, J Lichtman, RC Reid, SJ Smith, AS Szalay, **JT Vogelstein**, RJ 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. arxiv.

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

9. D Koutra, **JT Vogelstein**, C Faloutsos. *DELTACON: Measuring Connectivity Differences in Large Networks*. Proceedings of the 2013 SIAM International Conference on Data Mining. doi:10.1137/1.9781611972832.18. article, arxiv, code.

10. Q Huys, **JT Vogelstein**, P Dayan, L Bottou. *Psychiatry: Insights into depression through normative decision-making models*. Neural Information Processing Systems (2008) 729-736. article.

other publications

1. R Yuste, J MacLean, **JT Vogelstein**, L Paninski. *Imaging Action Potentials with Calcium Indicators*. Cold Spring Harb Protoc; 2011; doi:10.1101/pdb.prot5650. abstract, pdf.

2. **JT Vogelstein**. *Q&A: What is the Open Connectome Project?*. Neural Systems & Circuits, 2011 1:16. article.

3. **Vogelstein JT**, Vogelstein JV, Vogelstein B. Testing the effects of genetic variations using MINIME technology. Science, 286:2300-2301, 1999. (Essay) pdf.

unofficial supervision

current unofficial (co-) advisees

- Sanvesh Srivastava (Duke postdoc in ECE)
- William Gray Roncal (JHU grad student in ECE)
- Daniel P. Sussman (JHU postdoc in AMS)
- Disa Mhembere (JHU grad student in CS)
- Lee Chen (JHU grad student in AMS)
- Marcelo Fiori (Duke grad student in ECE)
- Yoon Woo (Billy) Byun (Duke grad student in BME)
- Ayushi Sinha (JHU grad student in CS)

past unofficial (co-) advisees

- Yichen Qin, Ph.D. (2013, AMS)
- Raghav K. Padmanabhan (postdoc; 2012-2013, ECE)
- Anderson Speed (undergrad; 2012-2013, ECE)

- Kevin Liang (undergrad; 2012-2013, ECE)
- Agastya Mondal (JHU undergrad, AMS)

invited talks (slides)

1. *Big Statistics in Brain Sciences*. Baylor College of Medicine, Department of Neuroscience, May 9th, 2014.
2. *Big (Neuro) Statistics*. Big Data: Practice Across Disciplines. Kavli Salon, Feb 19, 2014.
3. *Statistical Models and Inference for Big Brain-Graphs*. NIPS Workshop on "Acquiring and analyzing the activity of large neural ensembles", 2013.
4. *Beyond Little Neuroscience*. Beyond Optogenetics workshop at Cosyne, 2013.
5. *Statistical Inference on Graphs*. University of Michigan, 2013
6. *Statistical Inference on Graphs*. Scientific Computing Institute, University of Utah, 2013. video.
7. *Open Problems in Neuropsychiatry*. Data Seminar, Duke University, 2012.
8. *BIG NEURO*. Theory and Neurobiology, Duke University, 2012.
9. *Open Connectome Project*. Academic Medical Center, Amsterdam, 2012.
10. Connectome Classification: Statistical Graph Theoretic Methods for Analysis of MR-Connectome Data. Organization for Human Brain Mapping, 2011.
11. *Decision Theoretic Approach to Statistical Inference*. Guest Lecture in Current Topics in Machine Learning, Johns Hopkins University, 2011.
12. *Are mental properties supervenient on brain properties?* . NIPS workshop on Philosophy and Machine Learning, 2011.
13. *Once we get connectomes, what the %#$* are we going to do with them?* Krasnow Institute for Advanced Study at George Mason University, 2011.
14. *What can Translational Neuroimaging Research do for Clinical Practice*. Child Mind Institute, 2011.
15. *Consistent Graph Classification*. Guest Lecture in Deisseroth Lab, Stanford University, 2011.
16. *Once we get connectomes, what the %#$* are we going to do with them?* institute of neuroinformatics, 2011.
17. *Consistent Connectome Classification*. Math/Bio Seminar, Duke University, 2011.
18. *Statistical Connectomics*. Harvard University Connectomics Labs, 2010.
19. *Towards Inference and Analysis of Neural Circuits Inferred from Population Calcium Imaging*. Guest Lecture in Schnitzer Lab, 2009.
20. *Towards Inferring Neural Circuits from Calcium Imaging*. Guest Lecture in Yuste Lab, 2009.
21. *Neurocognitive Graph Theory*. National Security Agency, 2009.
22. *Sequential Monte Carlo in Neuroscience*. SAMSI Program on Sequential Monte Carlo, Tracking Working Group, 2009.
23. *OOPSI: A Family of Optimal OPtical Spike Inference Algorithms for Inferring Neural Connectivity from Population Calcium Imaging*. Dissertation Defense, 2009. (link to video.)
24. Inferring Spike Trains Given Calcium-Sensitive Fluorescence Observations. Statistical Analysis of Neural Data, 2008. slides.
25. *Inferring spike times given typical time-series fluorescence observations*. Department of Applied Mathematics and Statistics, Johns Hopkins University, 2008.
26. *Inferring Spike Trains from Calcium Imaging*. Redwood Center for Theoretical Neuroscience, University of California, Berkeley, 2008. video.
27. *Inferring Spike Trains from Calcium Imaging*. Cambridge University, Gatsby Unit, and

University College London, 2008.
28. *Model based optimal inference of spike times and calcium dynamics given noisy and intermittent calcium-fluorescence observations* at Neurotheory Center of Columbia University, 2007.

conference posters [(posters)](posters)

1. **JT Vogelstein**, CE Priebe. *Nonparametric Two-Sample Testing on Graph-Valued Data*. Duke Workshop on Sensing and Analysis of High-Dimensional Data, 2013.
2. Qin Y, et al. *Robust Clustering of Adjacency Spectral Embeddings of Brain Graph Data via Lq-Likelihood*. OHBM, 2013.
3. Koutra D, et al. *Are All Brains Wired Equally?*. OHBM, 2013.
4. Sussman D, et al. *Massive Diffusion MRI Graph Structure Preserves Spatial Information*. OHBM, 2013. poster.
5. Mhembere D, et al. *Multivariate Invariants from Massive Brain-Graphs*. OHBM, 2013. poster.
6. Gray W, et al. *Towards A Fully Automatic Pipeline for Connectome Estimation from High-Resolution EM Data*. OHBM, 2013. poster.
7. Craddock C, et al. *Towards Automated Analysis of Connectomes: The Configurable Pipeline for the Analysis of Connectomes*. OHBM, 2013.
8. Sismanis N, et al. *Feature Clustering from a Brain Graph for Voxel-to-Region Classification*. 5th Panhellenic Conference on Biomedical Technology, 2013. slides for invited talk.
9. **Vogelstein JT**, et al. *Anomaly Screening and Clustering of Multi-Object Movies via Multiscale Structure Learning*. XDATA Colloquium, 2013. poster.
10. Pnevmatikakis EA, et al. *Rank-penalized nonnegative spatiotemporal deconvolution and demixing of calcium imaging data*. COSYNE, 2013. (invited talk)
11. Airan RD, Vogelstein J, et al. *Reproducible differentiation of individual subjects with minimal acquisition time via resting state fMRI*. Proc ISMRM. 21:1932, 2013. poster.
12. Gray WR, et al. *Towards A Fully Automatic Pipeline for Connectome Estimation from High-Resolution EM Data*. Cold Spring Harbor Laboratory, Neuronal Circuits, 2012. poster.
13. **Vogelstein JT**, et al. *Statistical Connectomics*. Janelia Farm conference on Machine Learning, Statistical Inference and Neuroscience, 2012. poster.
14. **Vogelstein JT**, et al. *BRAINSTORM Towards Clinically and Scientifically Useful NeuroImaging Analytics*. Neuroinformatics, 2012. abstract.
15. **Vogelstein JT**, Vogelstein RJ, Priebe CE. *Are mental properties supervenient on brain properties?*poster.
16. **Vogelstein JT**, Fishkind DE, Sussman DL, Priebe CE. *Large Graph Classification: Theory and Statistical Connectomics Applications*. IMA conference on Large Graphs, 2011. poster.
17. **Vogelstein JT**, Sussman DL, Tang M, Fishkind DE, Priebe CE. *Dot Product Embedding in Large (Errorfully Observed) Graphs with Applications in Statistical Connectomics*. IMA conference on Large Graphs, 2011.poster.
18. **Vogelstein JT**, Perlman E, Bock D, Lee W-C, Chang M, Kasthuri B, Kazhdan M, Reid C, Lichtman J, Burns R, Vogelstein RJ. *Open Connectome Project: collectively reverse engineering the brain one synapse at a time*. Neuroinformatics, 2011.poster.
19. **Vogelstein JT**, Gray W, Vogelstein RJ, Bogovic J, Resnick S, Prince J, Priebe CE. *Connectome Classification: Statistical Graph Theoretic Methods for Analysis of MR-Connectome Data*. Organization for Human Brain Mapping, 2011. poster.

20. **Vogelstein JT**, Gray W, Martin JG, Coppersmith GC, Dredze M, Bogovic J, Prince JL, Resnick SM, Priebe CE, Vogelstein RJ. *Connectome Classification using statistical graph theory and machine learning*. Society for Neuroscience, 2011. [poster](#).

21. Gray WR, Bogovic JA, **Vogelstein JT**, Ye C, Landman BA, Prince JL, Vogelstein RJ. *Magnetic resonance connectome automated pipeline and repeatability analysis*. Society for Neuroscience, 2011.[poster](#).

22. **Vogelstein JT**, Priebe CE, Burns R, Vogelstein RH, Lichtman J. *Measuring and Reconstructing the Brain at the Synaptic Scale: Towards a Biofidelic Human Brain in silico*. DARPA Neural Engineering, Science and Technology Forum, 2010. [abstract](#), [poster](#).

23. Gray WR, **Vogelstein JT**, Bogovic J, Carass A, Prince JL, Landman B, Pham D, Ferrucci L, Resnick SM, Priebe CE, Vogelstein RJ. *Graph-Theoretical Methods for Statistical Inference on MR Connectome Data*.DARPA Neural Engineering, Science and Technology Forum, 2010. [abstract](#), [poster](#).

24. **Vogelstein JT**, Bogovic J, Carass A, Gray WR, Prince JL, Landman B, Pham D, Ferrucci L, Resnick SM, Priebe CE, Vogelstein RJ. *Graph-Theoretical Methods for Statistical Inference on MR Connectome Data*. Organization for Human Brain Mapping, 2010. [abstract](#), [poster](#).

25. **Vogelstein JT**, Vogelstein RJ, Priebe CE. *A Neurocognitive Graph-Theoretical Approach to Understanding the Relationship Between Minds and Brains*. CSHL conference on Neural Circuits, 2010. [poster](#).

26. **Vogelstein JT**, Mishchenko Y, Packer AM, Machado TA, Yuste R, Paninski L. *Towards Confirming Neural Circuit Inference from Population Calcium Imaging*. COSYNE, 2010. [poster](#).

27. **Vogelstein JT**, Mishchenko Y, Packer AM, Machado TA, Yuste R, Paninski L. *Towards Confirming Neural Circuit Inference from Population Calcium Imaging*. NIPS Workshop on Connectivity Inference in Neuroimaging, 2009. [poster](#).

28. **Vogelstein JT**,Packer AM, Mishchenko Y, Yuste R, Paninski L. *Towards Inferring Neural Circuits from Calcium Population Imaging*. COSYNE, 2010. [poster](#).

29. **Vogelstein JT**, Mishchenko Y, Packer AM, Machado TA, Yuste R, Paninski L. *Towards Confirming Neural Circuit Inference from Population Calcium Imaging*. Society forNeuroscience, 2009. [poster](#).

30. **Vogelstein JT**,Packer AM, Mishchenko Y, Yuste R, Paninski L. *Towards Inferring Neural Circuits from Calcium Population Imaging*. COSYNE, 2009. [poster](#).

31. **Vogelstein JT**, Babadi B, Watson BO, Yuste R, Paninski L. *From Calcium Sensitive Fluorescence Movies to Spike Trains*. Society forNeuroscience, 2008. [poster](#).

32. **Vogelstein JT**, Paninski L. *Spike Inference from Calcium Imaging using Sequential Monte Carlo Methods*. Statistical and Applied Mathematical Sciences Institute (SAMSI) Program on Sequential Monte Carlo Methods, 2008. [poster](#).

33. **Vogelstein JT**, Babadi B, Paninski L. *Model-Based Optimal Inference of Spike Times and Calcium Dynamics given Noisy and Intermittent Calcium-Fluorescence Imaging*. COSYNE, 2008. [poster](#), [spotlight slides](#).

34. **Vogelstein JT**, Paninski L. *Inferring Spike Trains, Learning Tuning Curves, and Estimating Connectivity from Calcium Imaging*. Integrative Approaches to Brain Complexity, 2008. [poster](#).

35. **Vogelstein JT**, Jedynak B, Zhang K, Paninski L. *Inferring Spike Trains, Neural Filters, and Network Circuits from in vivo Calcium Imaging*. Society for Neuroscience, 2007. [abstract](#).

36. **Vogelstein JT**, Zhang K, Jedynak B, Paninski L. *Maximum Likelihood Inference of Neuronal Dynamics under Noisy and Intermittent Observations using Sequential Monte Carlo EM Algorithms*. COSYNE, 2007. [poster](#).

37. **Vogelstein JT**, Zhang K, Paninski L. *Inferring spike trains, neural filters, and network circuits from in vivo calcium imaging*. Society for Neuroscience, 2007. [abstract](#).
38. **Vogelstein JT**, Zhang K. *A novel theory for simultaneous representation of multiple dynamic states in hippocampus*. Society for Neuroscience, 2004. [abstract](#).
39. **Vogelstein JT**, Zhang K. *A novel theory for simultaneous representation of multiple dynamic states in hippocampus*. Society for Neuroscience, 2004. [abstract](#).
40. **Vogelstein JT**, Snyder LH, Warchol M, Angelaki DE. *Up-down asymmetry in memory guided saccadic eye movements are independent of head orientation in space*. Society for Neuroscience, 2002. [abstract](#).

work in progress (some pre-prints available upon [request](#))

1. *DELTACON: A Principled Massive-Graph Similarity Function and Applications*. Joint work with D Koutra, N Shah, BJ Gallagher, C Faloutsos.
2. *Robust Bayesian Inference via Lq-Likelihood*. Joint work with DB Dunson, CE Priebe, Y Qin.
3. *Optimal Subspace Projection for High-Dimensional Classification and Testing*. Joint work with M Maggioni.
4. *Nonparametric Two-Sample Testing on Graph-Valued Populations*. Joint work with CE Priebe.
5. *Massive State Space Learning and Inference*. Joint work with S Chen, S Lee, Martin Lindquist, B Caffo.
6. *Neuronal Classification from Network Connectivity*. Joint work with R Goldin, D Marchette, P Salomonsky, CE Priebe, G Ascoli.
7. *Class Morphing*. Joint work with D Marchette, CE Priebe.
8. *Optimal Spike Inference from in vivo 2-Photon Calcium Imaging*. Joint work with D Greenberg, J Kerr.
9. *Extracting Proximity for Brain Graph Voxel Classification*. Joint work with N Sismanis, DL 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 CE Connor CE, et al.
2. *A Spiking Model of Ventral Cochlear Nucleus in Response to Complex Stimuli*. Joint work with E Young, 2004.
3. *A Hardware Emulator of Awake Behaving Macaque Primary Motor Cortex*. Joint work with D Moran, 2003.

awards, honors & misc

- 2013 to present: Assistant Consulting Professor, Dept. of Neurobiology, Duke University.
- 2013 to present: Senior Fellow at the Kenan Institute for Ethics, Duke University.
- 2012 to present: Member of the Institute for Data Intensive Engineering and Sciences, Johns Hopkins University.
- 2011: Trainee Abstract Award, Organization for Human Brain Mapping.
- 2010 to present: Adjunct Research Scientist, Human Language Technology Center of

Excellence, Johns Hopkins University.

- 2008: Spotlight, Computational and Systems Neuroscience (CoSyNe).
- 2008: Successfully completed *Molecular Biology Summer Workshop*. Smith College, Mass, USA.
- 2008: Successfully completed *Advanced Techniques in Molecular Neuroscience*. Cold Spring Harbor, New York, USA.
- 2005: Successfully audited *Imaging Structure and Function of the Nervous System*. Cold Spring Harbor, New York, USA.
- 2004 to 2012: Chief Scientist, Global Domain Partners, LLC.
- 2004: Successfully completed *Advanced Course in Computational Neuroscience*. Obidos, Portugal.
- 2002: Dean's List, Washington University.
- Summer of 2001: Research Assistant under Professor Randy O'Reilly, Dept. of Psychology, University of Colorado.
- Summer of 2000: Clinical Engineer, Johns Hopkins Hospital.
- Summer of 1999: Research Assistant under Dr. Jeffrey Williams, Dept. of Neurosurgery, Johns Hopkins Hospital.
- Summer of 1998: Research Assistant under Professor Kathy Cho, Dept. of Pathology, Johns Hopkins School of Medicine.
- Inproficient Languages: R, Python, C/C++, HTML, CSS.
- Proficient Languages: English, Hebrew, Love, Matlab, LaTeX.
- Founder & Co-Director: Open Connectome Project.