2019/11/26

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Joshua T. Vogelstein

Professional Experience

09/19 – now **Joint Appointment**, *Department of Biostatistics*, Johns Hopkins University (JHU).

08/18 – now **Director of Biomedical Data Science Focus Area**.

01/17 – now **Co-Founder**, *gigantum*.

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

01/16 – now **Co-Founder**, *d8alab*.

08/15 – now **Joint Appointment**, *Department of Applied Mathematics and Statistics*.

08/15 – now **Steering Committee**, *Kavli Neuroscience Discovery Institute (KNDI)*.

08/15 – 07/18 **Co-Developer**, *Computational Medicine Minor*.

05/15 – 07/17 **Co-Founder and Faculty Advisor**, *MedHacks*.

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

08/14 – now **Core Faculty**, *Institute for Computational Medicine (ICM)*.

08/14 – now **Core Faculty**, *Center for Imaging Science (CIS)*.

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*.

08/14 – 08/18 **Director of Undergraduate Studies**, *Institute for Computational Medicine*.

10/12 – now **Affiliated Faculty**, *Institute for Data Intensive Engineering and Sciences*.

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

10/12 – 08/14 **Endeavor Scientist**, *Child Mind Institute*.

08/12 – 08/14 **Affiliated Faculty**, *Kenan Institute for Ethics*.
Duke University

08/12 – 08/14 **Adjunct Faculty**, *Department of Computer Science*.

12/09 – 01/11 **Post-Doctoral Fellow**, *Department of Applied Mathematics and Statistics*, Supervised by Carey E. Priebe, Johns Hopkins University.
Research Statistics of populations of networks.

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*.

Education

2009 **Ph.D in Neuroscience**, *Johns Hopkins School of Medicine*,
Advisor: Eric Young,
Thesis: OOPSI: a family of optical spike inference algorithms for inferring neural connectivity from population calcium imaging .

2009 **M.S. in Applied Mathematics & Statistics**, *Johns Hopkins University*.

2002 **B.A. in Biomedical Engineering**, *Washington University, St. Louis*.

Awards and Recognition

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*.

Professional Memberships

SfN **Society for Neuroscience**.

Published Peer-Reviewed Research Articles

Note: CV author in bold; Trainees in italics,
(55 papers; top 10 cited 2,944 times; H-index 30)

[55] Shangsi Wang, Jesús Arroyo, **Joshua T Vogelstein**, and Carey E Priebe. "Joint Embedding of Graphs". In: *Transactions on Pattern Analysis and Machine Intelligence* in press (Oct. 2019). URL: http://arxiv.org/abs/1703.03862.

[54] Youjin Lee, Cencheng Shen, Carey E Priebe, and **Joshua T Vogelstein**. "Network dependence testing via diffusion maps and distance-based correlations". In: *Biometrika* (Sept. 2019). ISSN: 0006-3444. DOI: 10.1093/biomet/asz045. arXiv: 1703.10136. URL: https://doi.org/10.1093/biomet/asz045.

[53] *Jaewon Chung*, *Benjamin D Pedigo*, *Eric W Bridgeford*, *Bijan K Varjavand*, and **Joshua T Vogelstein**. "GraSPy: Graph Statistics in Python". In: *Journal of Machine Learning Research* 20.158 (Apr. 2019), pp. 1–7. URL: https://arxiv.org/abs/1904.05329.

[52] **Joshua T. Vogelstein**, *Eric W. Bridgeford*, *Benjamin D. Pedigo*, *Jaewon Chung*, Keith Levin, Brett Mensh, and Carey E. Priebe. "Connectal coding: discovering the structures linking cognitive phenotypes to individual histories". In: *Current Opinion in Neurobiology* 55 (Apr. 2019), pp. 199–212. ISSN: 18736882. DOI: 10.1016/j.conb.2019.04.005. URL: https://doi.org/10.1016/j.conb.2019.04.005.

[51] Jake J. Son, Jon C. Clucas, Curt White, Anirudh Krishnakumar, **Joshua T. Vogelstein**, Michael P. Milham, and Arno Klein. "Thermal sensors improve wrist-worn position tracking". In: *npj Digital Medicine* 2.1 (Feb. 2019). ISSN: 2398-6352. DOI: 10.1038/s41746-019-0092-2. URL: https://doi.org/10.1038/s41746-019-0092-2.

[50] Carey E. Priebe, Youngser Park, Joshua T. Vogelstein, John M. Conroy, Vince Lyzinski, Minh Tang, Avanti Athreya, Joshua Cape, and Eric Bridgeford. "On a two-truths phenomenon in spectral graph clustering". In: *Proceedings of the National Academy of Sciences of the United States of America* 116.13 (Feb. 2019), pp. 5995–6000. ISSN: 10916490. DOI: 10.1073/pnas.1814462116. arXiv: 1808.07801. URL: https://www.pnas.org/content/early/2019/03/07/1814462116.short.

[49] **Joshua T. Vogelstein**, *Eric W. Bridgeford*, Qing Wang, Carey E. Priebe, Mauro Maggioni, and Cencheng Shen. "Discovering and deciphering relationships across disparate data modalities". In: *eLife* 8 (Jan. 2019). ISSN: 2050084X. DOI: 10.7554/eLife.41690. arXiv: 1609.05148. URL: https://elifesciences.org/articles/41690.

[48] Runze Tang, Michael Ketcha, Alexandra Badea, Evan D Calabrese, Daniel S Margulies, **Joshua T Vogelstein**, Carey E Priebe, and Daniel L Sussman. "Connectome Smoothing via Low-rank Approximations". In: *Transactions in Medical Imaging* (Dec. 2018). URL: https://ieeexplore.ieee.org/document/8570772.

[47] Cencheng Shen, Carey E Priebe, and **Joshua T Vogelstein**. "From Distance Correlation to Multiscale Graph Correlation". In: *Journal of the American Statistical Association* (Oct. 2018). URL: https://www.tandfonline.com/doi/full/10.1080/01621459.2018.1543125.

[46] **Joshua T. Vogelstein**, Eric Perlman, Benjamin Falk, Alex Baden, William Gray Roncal, *Vikram Chandrashekhar*, Forrest Collman, Sharmishtaa Seshamani, Jesse L. Patsolic, Kunal Lillaney, Michael Kazhdan, Robert Hider, Derek Pryor, Jordan Matelsky, Timothy Gion, Priya Manavalan, Brock Wester, Mark Chevillet, Eric T. Trautman, Khaled Khairy, *Eric Bridgeford*, Dean M. Kleissas, Daniel J. Tward, Ailey K. Crow, Brian Hsueh, Matthew A. Wright, Michael I. Miller, Stephen J. Smith, R. Jacob Vogelstein, Karl Deisseroth, and Randal Burns. "A community-developed open-source computational ecosystem for big neuro data". In: *Nature Methods* 15.11 (Oct. 2018), pp. 846–847. ISSN: 15487105. DOI: 10.1038/s41592-018-0181-1. arXiv: 1804.02835. URL: https://www.nature.com/articles/s41592-018-0181-1.

[45] Avanti Athreya, Donniell E. Fishkind, Minh Tang, Carey E. Priebe, Youngser Park, **Joshua T. Vogelstein**, Keith Levin, Vince Lyzinski, Yichen Qin, and Daniel L. Sussman. "Statistical inference on random dot product graphs: A survey". In: *Journal of Machine Learning Research* 18 (May 2018), pp. 1–92. ISSN: 15337928. arXiv: 1709.05454. URL: http://jmlr.org/papers/v18/17-448.html.

[44] Joshua D. Cohen, Lu Li, Yuxuan Wang, Christopher Thoburn, Bahman Afsari, Ludmila Danilova, Christopher Douville, Ammar A. Javed, Fay Wong, Austin Mattox, Ralph H. Hruban, Christopher L. Wolfgang, Michael G. Goggins, Marco Dal Molin, Tian Li Wang, Richard Roden, Alison P. Klein, Janine Ptak, Lisa Dobbyn, Joy Schaefer, Natalie Silliman, Maria Popoli, **Joshua T. Vogelstein**, James D. Browne, Robert E. Schoen, Randall E. Brand, Jeanne Tie, Peter Gibbs, Hui Li Wong, Aaron S. Mansfield, Jin Jen, Samir M. Hanash, Massimo Falconi, Peter J. Allen, Shibin Zhou, Chetan Bettegowda, Luis A. Diaz, Cristian Tomasetti, Kenneth W. Kinzler, Bert Vogelstein, Anne Marie Lennon, and Nickolas Papadopoulos. "Detection and localization of surgically resectable cancers with a multi-analyte blood test". In: *Science* 359.6378 (Feb. 2018), pp. 926–930. ISSN: 10959203. DOI: 10.1126/science.aar3247. URL: https://doi.org/10.1126/science.aar3247.

[43] Daniele Durante, David B Dunson, and **Joshua T Vogelstein**. "Rejoinder: Nonparametric Bayes Modeling of Populations of Networks". In: *Journal of the American Statistical Association* 112 (Oct. 2017). ISSN: 0162-1459. DOI: 10.1080/01621459.2017.1395643. URL: https://doi.org/10.1080/01621459.2017.1395643.

[42] *Gregory Kiar*, Krzysztof J. Gorgolewski, Dean Kleissas, William Gray Roncal, Brian Litt, Brian Wandell, Russel A. Poldrack, Martin Wiener, R. Jacob Vogelstein, Randal Burns, and **Joshua T. Vogelstein**. "Science in the cloud (SIC): A use case in MRI connectomics". In: *GigaScience* 6.5 (May 2017), pp. 1–10. ISSN: 2047217X. DOI: 10.1093/gigascience/gix013. arXiv: 1610.08484. URL: https://academic.oup.com/gigascience/article-lookup/doi/10.1093/gigascience/gix013.

[41] Shaojie Chen, Kai Liu, Yuguang Yang, Yuting Xu, Seonjoo Lee, Martin Lindquist, Brian S. Caffo, and **Joshua T. Vogelstein**. "An M-estimator for reduced-rank system identification". In: *Pattern Recognition Letters* 86 (Jan. 2017), pp. 76–81. ISSN: 01678655. DOI: 10.1016/j.patrec.2016.12.012. URL: https://www.sciencedirect.com/science/article/pii/S0167865516303671.

[40] Anish K. Simhal, Cecilia Aguerrebere, Forrest Collman, **Joshua T. Vogelstein**, Kristina D. Micheva, Richard J. Weinberg, Stephen J. Smith, and Guillermo Sapiro. "Probabilistic fluorescence-based synapse detection". In: *PLoS Computational Biology* 13.4 (2017). ISSN: 15537358. DOI: 10.1371/journal.pcbi.1005493. URL: https://doi.org/10.1371/journal.pcbi.1005493.

[39] Da Zheng, Disa Mhembere, Vince Lyzinski, **Joshua T. Vogelstein**, Carey E. Priebe, and Randal Burns. "Semi-external memory sparse matrix multiplication for billion-node graphs". In: *IEEE Transactions on Parallel and Distributed Systems* 28.5 (2017), pp. 1470–1483. ISSN: 10459219. DOI: 10.1109/TPDS.2016.2618791. arXiv: 1602.02864. URL: https://ieeexplore.ieee.org/abstract/document/7593270.

[38] Cencheng Shen, **Joshua T. Vogelstein**, and Carey E. Priebe. "Manifold matching using shortest-path distance and joint neighborhood selection". In: *Pattern Recognition Letters* 92 (2017), pp. 41–48. ISSN: 01678655. DOI: 10.1016/j.patrec.2017.04.005. arXiv: 1412.4098. URL: http://www.sciencedirect.com/science/article/pii/S016786551730106X.

[37] N. Binkiewicz, **J. T. Vogelstein**, and K. Rohe. "Covariate-assisted spectral clustering". In: *Biometrika* 104.2 (2017), pp. 361–377. ISSN: 14643510. DOI: 10.1093/biomet/asx008. arXiv: 1411.2158. URL: https://doi.org/10.1093/biomet/asx008.

[36] Daniele Durante, David B. Dunson, and **Joshua T. Vogelstein**. "Nonparametric Bayes Modeling of Populations of Networks". In: *Journal of the American Statistical Association* 112.520 (2017), pp. 1516–1530. ISSN: 1537274X. DOI: 10.1080/01621459.2016.1219260. arXiv: 1406.7851. URL: https://doi.org/10.1080/01621459.2016.1219260.

[35] Qing Wang, Ming Zhang, Tyler Tomita, **Joshua T. Vogelstein**, Shibin Zhou, Nickolas Papadopoulos, Kenneth W. Kinzler, and Bert Vogelstein. "Selected reaction monitoring approach for validating peptide biomarkers". In: *Proceedings of the National Academy of Sciences of the United States of America* 114.51 (2017), pp. 13519–13524. ISSN: 10916490. DOI: 10.1073/pnas.1712731114. URL: http://www.pnas.org/content/114/51/13519.short.

[34] David Grant Colburn Hildebrand, Marcelo Cicconet, Russel Miguel Torres, Woohyuk Choi, Tran Minh Quan, Jungmin Moon, Arthur Willis Wetzel, Andrew Scott Champion, Brett Jesse Graham, Owen Randlett, George Scott Plummer, Ruben Portugues, Isaac Henry Bianco, Stephan Saalfeld, Alexander David Baden, Kunal Lillaney, Randal Burns, **Joshua Tzvi Vogelstein**, Alexander Franz Schier, Wei Chung Allen Lee, Won Ki Jeong, Jeff William Lichtman, and Florian Engert. "Whole-brain serial-section electron microscopy in larval zebrafish". In: *Nature* 545.7654 (2017), pp. 345–349. ISSN: 14764687. DOI: 10.1038/nature22356. URL: https://doi.org/10.1038/nature22356.

[33] Danai Koutra, Neil Shah, **Joshua T. Vogelstein**, Brian Gallagher, and Christos Faloutsos. "DELTACON: Principled massive-graph similarity function with attribution". In: *ACM Transactions on Knowledge Discovery from Data* 10.3 (Feb. 2016). ISSN: 1556472X. DOI: 10.1145/2824443. URL: http://doi.acm.org/10.1145/2824443.

[32] Vince Lyzinski, Donniell E. Fishkind, Marcelo Fiori, **Joshua T. Vogelstein**, Carey E. Priebe, and Guillermo Sapiro. "Graph Matching: Relax at Your Own Risk". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* 38.1 (Jan. 2016), pp. 60–73. ISSN: 01628828. DOI: 10.1109/TPAMI.2015.2424894. arXiv: 1405.3133. URL: http://doi.org/10.1109/TPAMI.2015.2424894.

[31] Eva L Dyer, William Gray Roncal, Hugo L Fernandes, Doga Gürsoy, Vincent De Andrade, Rafael Vescovi, Kamel Fezzaa, Xianghui Xiao, **Joshua T Vogelstein**, Chris Jacobsen, Konrad P Körding, and Narayanan Kasthuri. "Quantifying Mesoscale Neuroanatomy Using X-Ray Microtomography". In: *eNeuro* 4 (2016). ISSN: 2373-2822. DOI: 10.1523/ENEURO.0195-17.2017. URL: https://doi.org/10.1523/ENEURO.0195-17.2017.

[30] Raag D. Airan, **Joshua T. Vogelstein**, Jay J. Pillai, Brian Caffo, James J. Pekar, and Haris I. Sair. "Factors affecting characterization and localization of interindividual differences in functional connectivity using MRI". In: *Human Brain Mapping* 37.5 (2016), pp. 1986–1997. ISSN: 10970193. DOI: 10.1002/hbm.23150. URL: http://dx.doi.org/10.1002/hbm.23150.

[29] Li Chen, Cencheng Shen, **Joshua T. Vogelstein**, and Carey E. Priebe. "Robust Vertex Classification". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* 38.3 (2016), pp. 578–590. ISSN: 01628828. DOI: 10.1109/TPAMI.2015.2456913. URL: http://dx.doi.org/10.1109/TPAMI.2015.2456913.

[28] Carey E. Priebe, Daniel L. Sussman, Minh Tang, and **Joshua T. Vogelstein**. "Statistical Inference on Errorfully Observed Graphs". In: *Journal of Computational and Graphical Statistics* 24.4 (Oct. 2015), pp. 930–953. ISSN: 15372715. DOI: 10.1080/10618600.2014.951049. arXiv: 1211.3601. URL: https://doi.org/10.1080/10618600.2014.951049.

[27] Kristen M. Harris, Josef Spacek, Maria Elizabeth Bell, Patrick H. Parker, Laurence F. Lindsey, Alexander D. Baden, **Joshua T. Vogelstein**, and Randal Burns. "A resource from 3D electron microscopy of hippocampal neuropil for user training and tool development". In: *Scientific Data* 2 (2015). ISSN: 20524463. DOI: 10.1038/sdata.2015.46. URL: https://doi.org/10.1038/sdata.2015.46.

[26] Li Chen, **Joshua T Vogelstein**, Vince Lyzinski, and Carey E Priebe. "A Joint Graph Inference Case Study: the C.elegans Chemical and Electrical Connectomes". In: *Worm* 5 (2015). ISSN: 2162-4054. DOI: 10.1080/21624054.2016.1142041. URL: http://arxiv.org/abs/1507.08376.

[25] William R Gray Roncal, Dean M Kleissas, **Joshua T Vogelstein**, Priya Manavalan, Kunal Lillaney, Michael Pekala, Randal Burns, R Jacob Vogelstein, Carey E Priebe, Mark A Chevillet, and Gregory D Hager. "An automated images-to-graphs framework for high resolution connectomics". In: *Frontiers in Neuroinformatics* 9 (2015). ISSN: 1662-5196. DOI: 10.3389/fninf.2015.00020. URL: http://journal.frontiersin.org/article/10.3389/fninf.2015.00020.

[24] **Joshua T. Vogelstein**, John M. Conroy, Vince Lyzinski, Louis J. Podrazik, Steven G. Kratzer, Eric T. Harley, Donniell E. Fishkind, R. Jacob Vogelstein, and Carey E. Priebe. "Fast Approximate Quadratic programming for graph matching". In: *PLoS ONE* 10.4 (2015). ISSN: 19326203. DOI: 10.1371/journal.pone.0121002. URL: http://dx.doi.org/10.1371/journal.pone.0121002.

[23] **Joshua T. Vogelstein** and Carey E. Priebe. "Shuffled Graph Classification: Theory and Connectome Applications". In: *Journal of Classification* 32.1 (2015), pp. 3–20. ISSN: 14321343. DOI: 10.1007/s00357-015-9170-6. arXiv: 1112.5506. URL: https://doi.org/10.1007/s00357-015-9170-6.

[22] Vince Lyzinski, Daniel L. Sussman, Donniell E. Fishkind, Henry Pao, Li Chen, **Joshua T. Vogelstein**, Youngser Park, and Carey E. Priebe. "Spectral clustering for divide-and-conquer graph matching". In: *Parallel Computing* 47 (2015), pp. 70–87. ISSN: 01678191. DOI: 10.1016/j.parco.2015.03.004. arXiv: 1310.1297. URL: https://doi.org/10.1016/j.parco.2015.03.004.

[21] Narayanan Kasthuri, Kenneth Jeffrey Hayworth, Daniel Raimund Berger, Richard Lee Schalek, José Angel Conchello, Seymour Knowles-Barley, Dongil Lee, Amelio Vázquez-Reina, Verena Kaynig, Thouis Raymond Jones, Mike Roberts, Josh Lyskowski Morgan, Juan Carlos Tapia, H. Sebastian Seung, William Gray Roncal, **Joshua Tzvi Vogelstein**, Randal Burns, Daniel Lewis Sussman, Carey Eldin Priebe, Hanspeter Pfister, and Jeff William Lichtman. "Saturated Reconstruction of a Volume of Neocortex". In: *Cell* 162.3 (2015), pp. 648–661. ISSN: 10974172. DOI: 10.1016/j.cell.2015.06.054. URL: https://doi.org/10.1016/j.cell.2015.06.054.

[20] David E. Carlson, **Joshua T. Vogelstein**, Qisong Wu, Wenzhao Lian, Mingyuan Zhou, Colin R. Stoetzner, Daryl Kipke, Douglas Weber, David B. Dunson, and Lawrence Carin. "Multichannel electrophysiological spike sorting via joint dictionary learning and mixture modeling". In: *IEEE Transactions on Biomedical Engineering* 61.1 (Jan. 2014), pp. 41–54. ISSN: 00189294. DOI: 10.1109/TBME.2013.2275751. arXiv: 1304.0542. URL: http://ieeexplore.ieee.org/document/6571240/.

[19] Nicholas C. Weiler, Forrest Collman, **Joshua T. Vogelstein**, Randal Burns, and Stephen J. Smith. "Synaptic molecular imaging in spared and deprived columns of mouse barrel cortex with array tomography". In: *Scientific Data* 1 (2014). ISSN: 20524463. DOI: 10.1038/sdata.2014.46. URL: http://www.nature.com/articles/sdata201446.

[18] Elizabeth M. Sweeney, **Joshua T. Vogelstein**, Jennifer L. Cuzzocreo, Peter A. Calabresi, Daniel S. Reich, Ciprian M. Crainiceanu, and Russell T. Shinohara. "A comparison of supervised machine learning algorithms and feature vectors for MS lesion segmentation using multimodal structural MRI". In: *PLoS ONE* 9.4 (2014). ISSN: 19326203. DOI: 10.1371/journal.pone.0095753. URL: https://doi.org/10.1371/journal.pone.0095753.

[17] **Joshua T. Vogelstein**, Youngser Park, Tomoko Ohyama, Rex A. Kerr, James W. Truman, Carey E. Priebe, and Marta Zlatic. "Discovery of brainwide neural-behavioral maps via multiscale unsupervised structure learning". In: *Science* 344.6182 (2014), pp. 386–392. ISSN: 10959203. DOI: 10.1126/science.1250298. URL: https://science.sciencemag.org/content/344/6182/386.

[16] R. Cameron Craddock, Saad Jbabdi, Chao Gan Yan, **Joshua T. Vogelstein**, F. Xavier Castellanos, Adriana Di Martino, Clare Kelly, Keith Heberlein, Stan Colcombe, and Michael P. Milham. "Imaging human connectomes at the macroscale". In: *Nature Methods* 10.6 (2013), pp. 524–539. ISSN: 15487091. DOI: 10.1038/nmeth.2482. URL: https://doi.org/10.1038/nmeth.2482.

[15] Dai Dai, Huiguang He, **Joshua T. Vogelstein**, and Zengguang Hou. "Accurate prediction of AD patients using cortical thickness networks". In: *Machine Vision and Applications* 24.7 (2013), pp. 1445–1457. ISSN: 09328092. DOI: 10.1007/s00138-012-0462-0. URL: https://doi.org/10.1007/s00138-012-0462-0.

[14] **Joshua T. Vogelstein**, William Gray Roncal, R. Jacob Vogelstein, and Carey E. Priebe. "Graph classification using signal-subgraphs: Applications in statistical connectomics". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* 35.7 (2013), pp. 1539–1551. ISSN: 01628828. DOI: 10.1109/TPAMI.2012.235. arXiv: 1108.1427. URL: https://doi.org/10.1109/TPAMI.2012.235.

[13] Carey E. Priebe, **Joshua Vogelstein**, and Davi Bock. "Optimizing the quantity/quality trade-off in connectome inference". In: *Communications in Statistics - Theory and Methods* 42.19 (2013), pp. 3455–3462. ISSN: 03610926. DOI: 10.1080/03610926.2011.630768. arXiv: 1108.6271. URL: https://doi.org/10.1080/03610926.2011.630768.

[12] William R. Gray, John A. Bogovic, **Joshua T. Vogelstein**, Bennett A. Landman, Jerry L. Prince, and R. Jacob Vogelstein. "Magnetic resonance connectome automated pipeline: An overview". In: *IEEE Pulse* 3.2 (Mar. 2012), pp. 42–48. ISSN: 21542287. DOI: 10.1109/MPUL.2011.2181023. URL: http://ieeexplore.ieee.org/document/6173097/.

[11] Nicholas J Roberts, **Joshua T Vogelstein**, Giovanni Parmigiani, Kenneth W Kinzler, Bert Vogelstein, and Victor E Velculescu. "The predictive capacity of personal genome sequencing". In: *Science Translational Medicine* 4 (2012). ISSN: 19466234. DOI: 10.1126/scitranslmed.3003380. URL: https://doi.org/10.1126/scitranslmed.3003380.

[10] Donniell E. Fishkind, Daniel L. Sussman, Minh Tang, **Joshua T. Vogelstein**, and Carey E. Priebe. "Consistent adjacency-spectral partitioning for the stochastic block model when the model parameters are unknown". In: *SIAM Journal on Matrix Analysis and Applications* 34.1 (2012), pp. 23–39. ISSN: 08954798. DOI: 10.1137/120875600. arXiv: 1205.0309. URL: http://arxiv.org/abs/1205.0309.

[9] **Joshua T. Vogelstein**, R. Jacob Vogelstein, and Carey E. Priebe. "Are mental properties supervenient on brain properties?" In: *Scientific Reports* 1 (2011). ISSN: 20452322. DOI: 10.1038/srep00100. URL: https://doi.org/10.1038/srep00100.

[8] Yuriy Mishchencko, **Joshua T Vogelstein**, and Liam Paninski. "A Bayesian approach for inferring neuronal conectivity from calcium fluorescent imaging data". In: *The annals of applied statistics* 5 (2011). ISSN: 19326157. DOI: 10.1214/09-AOAS303. URL: https://doi.org/10.1214/09-AOAS303.

[7] Sonja B. Hofer, Ho Ko, Bruno Pichler, **Joshua Vogelstein**, Hana Ros, Hongkui Zeng, Ed Lein, Nicholas A. Lesica, and Thomas D. Mrsic-Flogel. "Differential connectivity and response dynamics of excitatory and inhibitory neurons in visual cortex". In: *Nature Neuroscience* 14.8 (2011), pp. 1045–1052. ISSN: 10976256. DOI: 10.1038/nn.2876. URL: https://doi.org/10.1038/nn.2876.

[6] Liam Paninski, Yashar Ahmadian, Daniel Gil Ferreira, Shinsuke Koyama, Kamiar Rahnama Rad, Michael Vidne, **Joshua Vogelstein**, and Wei Wu. "A new look at state-space models for neural data". In: *Journal of Computational Neuroscience* 29.1-2 (2010), pp. 107–126. ISSN: 09295313. DOI: 10.1007/s10827-009-0179-x. URL: https://doi.org/10.1007/s10827-009-0179-x.

[5] **Joshua T. Vogelstein**, Brendon O. Watson, Adam M. Packer, Rafael Yuste, Bruno Jedynak, and Liam Paninskik. "Spike inference from calcium imaging using sequential Monte Carlo methods". In: *Biophysical Journal* 97.2 (2009), pp. 636–655. ISSN: 15420086. DOI: 10.1016/j.bpj.2008.08.005. URL: https://doi.org/10.1016/j.bpj.2008.08.005.

[4] **Joshua T Vogelstein**, Adam M Packer, Tim A Machado, Tanya Sippy, Baktash Babadi, Rafael Yuste, and Liam Paninski. "Fast non-negative deconvolution for spike train inference from population calcium imaging". In: *Journal of Neurophysiology* 104 (2009). ISSN: 0022-3077. DOI: 10.1152/jn.01073.2009. arXiv: 0912.1637. URL: https://doi.org/10.1152/jn.01073.2009.

[3] R. Jacob Vogelstein, Udayan Mallik, **Joshua T. Vogelstein**, and Gert Cauwenberghs. "Dynamically reconfigurable silicon array of spiking neurons with conductance-based synapses". In: *IEEE Transactions on Neural Networks* 18.1 (2007), pp. 253–265. ISSN: 10459227. DOI: 10.1109/TNN.2006.883007. URL: https://doi.org/10.1109/TNN.2006.883007.

[2] **Joshua T. Vogelstein**, Lawrence H. Snyder, and Dora E. Angelaki. "Accuracy of saccades to remembered targets as a function of body orientation in space". In: *Journal of Neurophysiology* 90.1 (2003), pp. 521–524. ISSN: 00223077. DOI: 10.1152/jn.00141.2003. URL: https://doi.org/10.1152/jn.00141.2003.

[1] David L Greenspan, Denise C Connolly, Rong Wu, Rachel Y Lei, **Joshua T C Vogelstein**, Young Tak Kim, Jung Eun Mok, Nubia Muñoz, F Xavier Bosch, Keerti Shah, and Kathleen R Cho. "Loss of FHIT expression in cervical carcinoma cell lines and primary tumors". In: *Cancer Research* 57 (1997). ISSN: 00085472. URL: http://cancerres.aacrjournals.org/content/57/21/4692.

Conference Papers

[20] James Browne, Disa Mhembere, Tyler M. Tomita, Joshua T. Vogelstein, and Randal Burns. "Forest packing: Fast parallel, decision forests". In: *SIAM International Conference on Data Mining, SDM 2019* (June 2019), pp. 46–54. DOI: 10.1137/1.9781611975673.6. arXiv: 1806.07300. URL: https://arxiv.org/abs/1806.07300.

[19] Aki Nikolaidis, Anibal Solon Heinsfeld, Ting Xu, Pierre Bellec, **Joshua Vogelstein**, and Michael Milham. "Bagging Improves Reproducibility of Functional Parcellation of the Human Brain". In: *bioRxiv* (June 2019), p. 343392. DOI: 10.1101/343392. URL: http://biorxiv.org/content/early/2019/08/28/343392.abstract.

[18] Kunal Lillaney, Dean Kleissas, Alexander Eusman, Eric Perlman, William Gray Roncal, **Joshua T. Vogelstein**, and Randal Burns. "Building NDStore through hierarchical storage management and microservice processing". In: *Proceedings - IEEE 14th International Conference on eScience, e-Science 2018* (2018), pp. 223–233. DOI: 10.1109/eScience.2018.00037. URL: https://ieeexplore.ieee.org/abstract/document/8588656.

[17] *Tyler M. Tomita*, Mauro Maggioni, and **Joshua T. Vogelstein**. "ROFLMAO: Robust oblique forests with linear MAtrix operations". In: *Proceedings of the 17th SIAM International Conference on Data Mining, SDM 2017*. SIAM. 2017, pp. 498–506. ISBN: 9781611974874. DOI: 10.1137/1.9781611974973.56.

[16] Disa Mhembere, Carey E Priebe, **Joshua T Vogelstein**, and Randal Burns. "knor : A NUMA-Optimized In-Memory , Distributed and Semi-External-Memory k-means Library". In: *Proceedings of the 26th International Symposium on High-Performance Parallel and Distributed Computing*. ACM. Proceedings of the 26th International Symposium on High-Performance Parallel and Distributed Computing, 2017. ISBN: 9781450346993. URL: https://arxiv.org/abs/1606.08905.

[15] Kwame S. Kutten, Nicolas Charon, Michael I. Miller, J. Tilak Ratnanather, *Jordan Matelsky*, Alexander D. Baden, Kunal Lillaney, Karl Deisseroth, Li Ye, and **Joshua T. Vogelstein**. "A large deformation diffeomorphic approach to registration of CLARITY images via mutual information". In: *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* 10433 LNCS (2017), pp. 275–282. ISSN: 16113349. DOI: 10.1007/978-3-319-66182-7_32. arXiv: 1612.00356. URL: https://link.springer.com/chapter/10.1007/978-3-319-66182-7%7B%5C_%7D32.

[14] Da Zheng, Disa Mhembere, **Joshua T. Vogelstein**, Carey E. Priebe, and Randal Burns. "FlashR: R-Programmed Parallel and Scalable Machine Learning using SSDs". In: *PPoPP* (May 2016). arXiv: 1604.06414. URL: http://arxiv.org/abs/1604.06414.

[13] Kwame S. Kutten, **Joshua T. Vogelstein**, Nicolas Charon, Li Ye, Karl Deisseroth, and Michael I. Miller. "Deformably registering and annotating whole CLARITY brains to an atlas via masked LDDMM". In: *Optics, Photonics and Digital Technologies for Imaging Applications IV* 9896 (2016), p. 989616. ISSN: 1996756X. DOI: 10.1117/12.2227444. arXiv: 1605.02060. URL: https://doi.org/10.1117/12.2227444.

[12] William Gray Roncal, Michael Pekala, Verena Kaynig-Fittkau, Dean M Kleissas, **Joshua T Vogelstein**, Hanspeter Pfister, Randal Burns, R Jacob Vogelstein, Mark A Chevillet, and Gregory D Hager. "VESICLE: Volumetric Evaluation of Synaptic Inferfaces using Computer Vision at Large Scale". In: *British Machine Vision Conference*. 2015, pp. 81.1–81.13. DOI: 10.5244/c.29.81. arXiv: 1403.3724.

[11] Da Zheng, Disa Mhembere, Randal Burns, **Joshua T Vogelstein**, Carey E Priebe, and Alexander S Szalay. "FlashGraph: Processing Billion-Node Graphs on an Array of Commodity SSDs". In: *USENIX Conference on File and Storage Technologies*. 2015. URL: http://arxiv.org/abs/1408.0500.

[10] Disa Mhembere, William Gray Roncal, Daniel Sussman, Carey E. Priebe, Rex Jung, Sephira Ryman, R. Jacob Vogelstein, **Joshua T. Vogelstein**, and Randal Burns. "Computing scalable multivariate glocal invariants of large (brain-) graphs". In: *2013 IEEE Global Conference on Signal and Information Processing, GlobalSIP 2013 - Proceedings* (Dec. 2013), pp. 297–300. DOI: 10.1109/GlobalSIP.2013.6736874. URL: http://arxiv.org/abs/1312.4318%20http://dx.doi.org/10.1109/GlobalSIP.2013.6736874.

[9] William Gray Roncal, Zachary H. Koterba, Disa Mhembere, Dean M. Kleissas, **Joshua T. Vogelstein**, Randal Burns, Anita R. Bowles, Dimitrios K. Donavos, Sephira Ryman, Rex E. Jung, Lei Wu, Vince Calhoun, and R. Jacob Vogelstein. "MIGRAINE: MRI graph reliability analysis and inference for connectomics". In: *2013 IEEE Global Conference on Signal and Information Processing, GlobalSIP 2013 - Proceedings*. IEEE, Dec. 2013, pp. 313–316. ISBN: 9781479902484. DOI: 10.1109/GlobalSIP.2013.6736878. URL: http://ieeexplore.ieee.org/document/6736878/.

[8] Randal Burns, William Gray Roncal, Dean Kleissas, Kunal Lillaney, Priya Manavalan, Eric Perlman, Daniel R. Berger, Davi D. Bock, Kwanghun Chung, Logan Grosenick, Narayanan Kasthuri, Nicholas C. Weiler, Karl Deisseroth, Michael Kazhdan, Jeff Lichtman, R. Clay Reid, Stephen J. Smith, Alexander S. Szalay, **Joshua T. Vogelstein**, and R. Jacob Vogelstein. "The open connectome project data cluster: Scalable analysis and vision for high-throughput neuroscience". In: *ACM International Conference Proceeding Series*. ACM. 2013. ISBN: 9781450319218. DOI: 10.1145/2484838.2484870. arXiv: 1306.3543. URL: http://arxiv.org/abs/1306.3543.

[7] Bruno Cornelis, Yun Yang, **Joshua T. Vogelstein**, Ann Dooms, Ingrid Daubechies, and David Dunson. "Bayesian crack detection in ultra high resolution multimodal images of paintings". In: *2013 18th International Conference on Digital Signal Processing, DSP 2013* (2013). DOI: 10.1109/ICDSP.2013.6622710. URL: http://arxiv.org/abs/1304.5894.

[6] Danai Koutra, **Joshua T. Vogelstein**, and Christos Faloutsos. "DELTACON: A principled massive-graph similarity function". In: *Proceedings of the 2013 SIAM International Conference on Data Mining, SDM 2013* (2013), pp. 162–170. ISSN: 1095-712X. DOI: 10.1137/1.9781611972832.18. arXiv: 1304.4657. URL: http://arxiv.org/abs/1304.4657.

[5] David Carlson, Vinayak Rao, **Joshua Vogelstein**, and Lawrence Carin. "Real-time inference for a gamma process model of neural spiking". In: *Advances in Neural Information Processing Systems* (2013). ISSN: 10495258. URL: http://papers.nips.cc/paper/5061-real-time-inference-for-a-gamma-process-model-of-neural-spiking.pdf.

[4] Marcelo Fiori, Pablo Sprechmann, **Joshua Vogelstein**, Pablo Muse, and Guillermo Sapiro. "Robust Multimodal Graph Matching: Sparse Coding Meets Graph Matching". In: *Advances in Neural Information Processing Systems* (2013). ISSN: 10495258. URL: http://papers.nips.cc/paper/4925-robust-multimodal-graph-matching-sparse-coding-meets-graph-matching.

[3] Francesca Petralia, **Joshua Vogelstein**, and David B Dunson. "Multiscale Dictionary Learning for Estimating Conditional Distributions". In: *Advances in Neural Information Processing Systems* (2013). ISSN: 10495258. URL: https://papers.nips.cc/paper/4944-multiscale-dictionary-learning-for-estimating-conditional-distributions.

[2] Vivek Kulkarni, Jagat Sastry Pudipeddi, Leman Akoglu, **Joshua T. Vogelstein**, R. Jacob Vogelstein, Sephira Ryman, and Rex E. Jung. "Sex differences in the human connectome". In: *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*. Vol. 8211 LNAI. Springer. 2013, pp. 82–91. ISBN: 9783319027524. DOI: 10.1007/978-3-319-02753-1_9. URL: https://pdfs.semanticscholar.org/98da/eeccc6d3cc80b789de30ecf8790c56950739.pdf.

[1] Quentin J Huys, **Joshua Vogelstein**, and Peter Dayan. "Psychiatry: Insights into depression through normative decision-making models". In: *Advances in Neural Information Processing Systems* (2008). URL: http://papers.nips.cc/paper/3563-psychiatry-insights-into-depression-through-normative-decision-making-models.pdf.

Book Chapters

Manuscripts in Revision

Manuscripts in First Review

Manuscripts in Preparation for Submission

[29] *Ronak Mehta*, Cencheng Shen, Ting Xu, and **Joshua T. Vogelstein**. "A Consistent Independence Test for Multivariate Time-Series". In: *arxiv* (Oct. 2019). URL: https://arxiv.org/abs/1908.06486.

[28] *Eric W. Bridgeford*, Shangsi Wang, Zhi Yang, Zeyi Wang, Ting Xu, Cameron Craddock, *Gregory Kiar*, William Gray-Roncal, Carey E. Priebe, Brian Caffo, Michael Milham, Xi-Nian Zuo, Consortium for Reliability and Reproduciblity, and **Joshua T. Vogelstein**. "Optimal Experimental Design for Big Data: Applications in Brain Imaging". In: *bioRxiv* (Oct. 2019). URL: https://doi.org/10.1101/802629.

[27] Marc-Andre Schulz, B.T. Thomas Yeo, **Joshua T. Vogelstein**, Janaina Mourao-Miranada, Jakob N. Kather, Konrad Kording, Blake Richards, and Danilo Bzdok. "Deep learning for brains?: Different linear and nonlinear scaling in UK Biobank brain images vs. machine-learning datasets". In: *bioRxiv* (Sept. 2019). DOI: 10.1101/757054. URL: https://www.biorxiv.org/content/early/2019/09/06/757054.

[26] *Ronan Perry*, Tyler M Tomita, Jesse Patsolic, Benjamin Falk, and **Joshua T Vogelstein**. "Manifold Forests: Closing the Gap on Neural Networks". In: *arXiv* (Sept. 2019). URL: https://arxiv.org/abs/1909.11799.

[25] *Tyler M. Tomita*, James Browne, Cencheng Shen, *Jaewon Chung*, Jesse L. Patsolic, Benjamin Falk, Jason Yim, Carey E. Priebe, Randal Burns, Mauro Maggioni, and **Joshua T. Vogelstein**. "Sparse Projection Oblique Randomer Forests". In: *arXiv* (Sept. 2019). URL: http://arxiv.org/abs/1506.03410.

[24] Ting Xu, Karl-Heinz Nenning, Ernst Schwartz, Seok-Jun Hong, **Joshua T. Vogelstein**, Damien A. Fair, Charles E. Schroeder, Daniel S. Margulies, Jonny Smallwood, Michael P. Milham, and Georg Langs. "Cross-species Functional Alignment Reveals Evolutionary Hierarchy Within the Connectome". In: *bioRxiv* (July 2019). URL: https://doi.org/10.1101/692616.

[23] Aki Nikolaidis, Anibal Solon Heinsfeld, Ting Xu, Pierre Bellec, **Joshua T. Vogelstein**, and Michael Milham. "Bagging Improves Reproducibility of Functional Parcellation of the Human Brain". In: *bioRxiv* (July 2019). URL: https://www.biorxiv.org/content/10.1101/343392v3.

[22] *Richard Guo*, Cencheng Shen, and **Joshua T. Vogelstein**. "Estimating Information-Theoretic Quantities with Random Forests". In: *arXiv* (July 2019). URL: https://arxiv.org/abs/1907.00325.

[21] *Meghana Madhyastha*, Percy Li, James Browne, Veronika Strnadova-Neely, Carey E. Priebe, Randal Burns, and **Joshua T. Vogelstein**. "Geodesic Learning via Unsupervised Decision Forests". In: *arXiv* (July 2019). URL: https://arxiv.org/abs/1907.02844.

[20] Disa Mhembere, Da Zheng, **Joshua T. Vogelstein**, Carey E. Priebe, and Randal Burns. "Graphyti: A Semi-External Memory Graph Library for FlashGraph". In: *arXiv* (July 2019). URL: https://arxiv.org/abs/1907.03335.

[19] Nian Wang, Robert J Anderson, David G Ashbrook, *Vivek Gopalakrishnan*, Youngser Park, Carey E Priebe, Yi Qi, **Joshua T Vogelstein**, Robert W Williams, and Allan G Johnson. "Node-Specific Heritability in the Mouse Connectome". In: *bioRxiv* (July 2019). URL: https://www.biorxiv.org/content/10.1101/701755v1.

[18] *Sambit Panda*, Satish Palaniappan, Junhao Xiong, Ananya Swaminathan, Sandhya Ramachandran, Eric W. Bridgeford, Cencheng Shen, and **Joshua T. Vogelstein**. "mgcpy: A Comprehensive High Dimensional Independence Testing Python Package". In: *arXiv* (July 2019). URL: https://arxiv.org/abs/1907.02088.

[17] Seok-Jun Hong, **Joshua T Vogelstein**, G Gozzi, Boris C Bernhardt, Thomas B.T. Yeo, Michael P Milham, and Adriana Di Martino. "Towards Neurosubtypes in Autism". In: *bioRxiv* in press (July 2019).

[16] Junhao Xiong, Cencheng Shen, Jesús Arroyo, and **Joshua T. Vogelstein**. "Graph Independence Testing". In: *arXiv* (June 2019). URL: https://arxiv.org/abs/1906.03661.

[15] Jesús Arroyo, Avanti Athreya, Joshua Cape, Guodong Chen, Carey E. Priebe, and **Joshua T. Vogelstein**. "Inference for multiple heterogenous networks with a common invariant subspace". In: *arXiv* (June 2019). URL: https://arxiv.org/abs/1906.10026.

[14] Hayden Helm, **Joshua V. Vogelstein**, and Carey E. Priebe. "Vertex Classification on Weighted Networks". In: *arXiv* (June 2019). URL: https://arxiv.org/abs/1906.02881.

[13] Dia Mhembere, Da Zheng, Carey E Priebe, **Joshua T Vogelstein**, and Randal Burns. "clusterNOR: A NUMA-Optimized Clustering Framework". In: *arxiv* (Feb. 2019). URL: https://arxiv.org/abs/1902.09527.

[12] Audrey Branch, Daniel Tward, **Joshua T Vogelstein**, Zhuhao Wu, and Michela Gallagher. "An optimized protocol for iDISCO+ rat brain clearing, imaging, and analysis". In: *bioRxiv* (2019). DOI: 10.1101/639674. eprint: https://www.biorxiv.org/content/early/2019/05/17/639674.full.pdf. URL: https://www.biorxiv.org/content/early/2019/05/17/639674.

[11] Cencheng Shen and **Joshua T Vogelstein**. "Decision Forests Induce Characteristic Kernels". In: *arXiv* (Dec. 2018). URL: https://arxiv.org/abs/1812.00029.

[10] David S Greenberg, Damian J Wallace, Kay-Michael Voit, Silvia Wuertenberger, Uwe Czubayko, Arne Monsees, Takashi Handa, **Joshua T Vogelstein**, Reinhard Seifert, Yvonne Groemping, and Jason ND Kerr. "Accurate action potential inference from a calcium sensor protein through biophysical modeling". In: *bioRxiv* (Nov. 2018). DOI: 10.1101/479055. eprint: https://www.biorxiv.org/content/early/2018/11/29/479055.full.pdf. URL: https://www.biorxiv.org/content/early/2018/11/29/479055.

[9] **Joshua T Vogelstein**, *Eric Bridgeford*, Minh Tang, Da Zheng, Randal Burns, and Mauro Maggioni. "Geometric Dimensionality Reduction for Subsequent Classification". In: *arXiv* 1050 (Nov. 2018), p. 21. URL: https://arxiv.org/abs/1709.01233.

[8] Zeyi Wang, Haris Sair, Ciprian Crainiceanu, Martin Lindquist, Bennett A Landman, Susan Resnick, **Joshua T. Vogelstein**, and Brian Scott Caffo. "On statistical tests of functional connectome fingerprinting". In: *bioRxiv* (Oct. 2018). URL: https://www.biorxiv.org/content/early/2018/10/15/443556.

[7] Cencheng Shen and **Joshua T. Vogelstein**. "The Exact Equivalence of Distance and Kernel Methods for Hypothesis Testing". In: *arXiv* (July 2018). URL: https://arxiv.org/abs/1806.05514.

[6] *Gregory Kiar*, *Eric Bridgeford*, Will Gray Roncal, *Consortium for Reliability (CoRR)*, Reproducibliity, Vikram Chandrashekhar, Disa Mhembere, Sephira Ryman, Xi-Nian Zuo, Daniel S Marguiles, R Cameron Craddock, Carey E Priebe, Rex Jung, Vince Calhoun, Brian Caffo, Randal Burns, **Michael P Milham**, and Joshua Vogelstein. "A High-Throughput Pipeline Identifies Robust Connectomes But Troublesome Variability". In: *bioRxiv* (Apr. 2018). DOI: 10.1101/188706. URL: https://www.biorxiv.org/content/early/2018/04/24/188706.

[5] Shangsi Wang, Cencheng Shen, Alexandra Badea, Carey E Priebe, and **Joshua T Vogelstein**. "Signal Subgraph Estimation Via Vertex Screening". In: *arXiv* (Jan. 2018). eprint: arXiv. URL: https://arxiv.org/abs/1801.07683.

[4] *Gregory Kiar*, *E Bridgeford*, *Vikram Chandrashekhar*, Disa Mhembere, Randal Burns, William R Gray Roncal, and **Joshua T Vogelstein**. "A comprehensive cloud framework for accurate and reliable human connectome estimation and meganalysis". In: *bioRxiv* (Sept. 2017), p. 188706. URL: https://www.biorxiv.org/content/early/2017/09/14/188706.

[3] Guilherme Franca, Maria L Rizzo, and **Joshua T. Vogelstein**. "Kernel k-Groups via Hartigan's Method". In: *arXiv* (Aug. 2017). URL: https://arxiv.org/abs/1710.09859.

[2] Runze Tang, Minh Tang, **Joshua T Vogelstein**, and Carey E Priebe. "Robust Estimation from Multiple Graphs under Gross Error Contamination". In: *arXiv* (July 2017). eprint: arXiv. URL: https://arxiv.org/abs/1707.03487.

[1] Vince Lyzinski, Sancar Adali, **Joshua T. Vogelstein**, Youngser Park, and Carey E. Priebe. "Seeded Graph Matching Via Joint Optimization of Fidelity and Commensurability". In: *arXiv* (Jan. 2014). eprint: 1401.3813. URL: http://arxiv.org/abs/1401.3813.

Invited Talks

[37] **Joshua T. Vogelstein**. "Open Access to the Brain: a Computer "Connectome" Links Brain Images in Fine Detail". In: JHM Boot Camp, June 2019. URL: https://neurodata.io/talks/bootcamp19.html.

[36] *Jaewon Chung*. "Statistical Methods for Population of Connectomes". In: Organization of Human Brain Mapping, June 2019. URL: https://neurodata.io/talks/ohbm19.html.

[35] **Joshua T. Vogelstein**. "Statistical Foundations For Connectomics". In: Max Planck / HHMI Connectomics Meeting, Apr. 2019. URL: https://neurodata.io/talks/connectomics19.html.

[34] **Joshua T. Vogelstein**. "Big Biomedical Data Science". In: Sol Goldman International Conference, Apr. 2019. URL: https://neurodata.io/talks/goldman19.html.

[33] **Joshua T. Vogelstein**. "Connectal Coding". In: Dipy Workshop, Mar. 2019. URL: https://neurodata.io/talks/DiPy19.html.

[32] **Joshua T. Vogelstein**. "Connectome Coding". In: Society for Neuroscience, Nov. 2018. URL: https://neurodata.io/talks/SFN18.html.

[31] **Joshua T Vogelstein**. "A Community-Developed Open-Source Computational Ecosystem for Big Neuro Data". In: Princeton, Aug. 2018. URL: https://neurodata.io/talks/princeton2018.html.

[30] *Eric W Bridgeford*. "A High-Throughput Pipeline Identifies Robust Connectomes but Troublesome Variability". In: Organization of Human Brain Mapping, July 2018. URL: http://ericwb.me/lectures/ohbm/ohbm_ndmg.html#/.

[29] Eric Perlman. "NeuroData: Embracing Open Source for Big Data Neuroscience". In: NSF NeuroNex Workshop on Super 3DEM, July 2018. URL: https://neurodata.io/talks/neuronex-3dem.html.

[28] **Joshua T. Vogelstein**. "Using Big Data Science to Understand What Goes On in our Heads". In: SOHOP Faculty Spotlight, Apr. 2018. URL: https://neurodata.io/talks/big-data-science/.

[27] **Joshua T Vogelstein**. "Discovering Relationships and their Geometry Across Disparate Data Modalities". In: Yale, Jan. 2018. URL: http://docs.neurodata.io/MGC-paper/.

[26] **Joshua T. Vogelstein**. "Discovering Relationships and their Geometry Across Disparate Data Modalities". In: Stanford, Aug. 2017. URL: http://docs.neurodata.io/MGC-paper/.

[25] **Joshua T. Vogelstein**. "Opportunities and Challenges in Big Data Neuroscience". In: Society for Neuroscience, 2017.

[24] **Joshua T Vogelstein**. "Using Big Data Science to Understand What Goes on in Our Heads". In: SOHOP Faculty Spotlight, 2017. URL: https://neurodata.io/talks/big-data-science/.

[23] **Joshua T Vogelstein**. "Challenges and Opportunities in Big Data for Neuroscientists". In: Society for Neuroscience: DC Metro Area Chapter Keynote Address, 2017. URL: https://neurodata.io/talks/sfn17.html.

[22] **Joshua T Vogelstein**. "Using Big Data Science to Understand What Goes on in Our Heads". In: SOHOP Faculty Spotlight, 2016. URL: https://neurodata.io/talks/big-data-science/.

[21] **Joshua T Vogelstein**. "NeuroData: Enabling Terascale Neuroscience for Everyone". In: Keystone Symposia: State of the Brain, 2016.

[20] **Joshua T. Vogelstein**. "The International Brain Station (TIBS)". In: Kavli Foundation, 2016.

[19] **Joshua T. Vogelstein**. "The International Brain Station (TIBS)". In: United Nations Global Brain Workshop Meeting, 2016.

[18] **Joshua T Vogelstein** and Liam Paninski. "Spike inference from calcium imaging using sequential Monte Carlo methods". In: AMSI Program on Sequential Monte Carlo, 2015. URL: https://figshare.com/articles/Spike_Inference_from_Calcium_Imaging_using_Sequential_Monte_Carlo_Methods/1285825.

[17] **Joshua T Vogelstein**. "Top Challenges of Big Data Neuroscience". In: BRAIN Initiative Workshop, Dec. 2014.

[16] **Joshua T Vogelstein**. "Big (Neuro) Statistics". In: Kavli Salon: Big Data: Practice Across Disciplines, 2014. URL: http://figshare.com/articles/Big%5C_Neuro%5C_Statistics/1142907.

[15] **Joshua T Vogelstein**. "Open-Science Platform for Heterogeneous Brain Data: Opportunities and Challenges". In: Kavli, 2014.

[14] **Joshua T Vogelstein**. "Beyond Little Neuroscience". In: Beyond Optogenetics workshop at Cosyne, 2013.

[13] **Joshua T Vogelstein**. "Statistical Inference on Graphs". In: University of Michigan, 2013.

[12] **Joshua T Vogelstein**. "Statistical Inference on Graphs". In: Scientific Computing Institute, University of Utah, 2013.

[11] **Joshua T Vogelstein**. "BIG NEURO". In: Theory and Neurobiology, Duke University, 2012.

[10] **Joshua T Vogelstein**. "Connectome Classification: Statistical Graph Theoretic Methods for Analysis of MR-Connectome Data". In: Organization for Human Brain Mapping, 2011.

[9] **Joshua T Vogelstein**. "Consistent Connectome Classification". In: Math/Bio Seminar, Duke University, 2011.

[8] **Joshua T Vogelstein**. "Once we get connectomes, what the %#* are we going to do with them?" In: Krasnow Institute for Advanced Study at George Mason Univeristy, 2011.

[7] **Joshua T Vogelstein**. "Once we get connectomes, what the %#* are we going to do with them?" In: Institute of Neuroinformatics, 2011.

[6] **Joshua T Vogelstein**. "Statistical Connectomics". In: Harvard University Connectomics Labs, 2011.

[5] **Joshua T Vogelstein**. "What can Translational neuroimaging Research do for Clinical Practice". In: Child Mind Institute, 2011.

[4] **Joshua T Vogelstein**. "Inferring Spike Trains Given Calcium-Sensitive Fluorescence Observations". In: Statistical Analysis of Neural Data, 2008.

[3] **Joshua T Vogelstein**. "Inferring spike trains from Calcium Imaging". In: Redwood Center for Theoretical Neuroscience, University of California, Berkeley, 2008.

[2] **Joshua T Vogelstein**. "Inferring spike trains from Calcium Imaging". In: Cambridge University, Gatsby Unit, and University College London, 2008.

[1] **Joshua T Vogelstein**. "Model based optimal inference of spike times and calcium dynamics givern noisy and intermittent calcium-fluorescence observations". In: Neurotheory Center of Columbia University, 2007.

Other Talks

[66] **Joshua T. Vogelstein**. "Ailey in an Hour: (A "Soup-to-Nuts" Pipeline for Analysis of Whole Cleared Brain Data)". In: NeuroNex, Oct. 2019. URL: https://neurodata.io/talks/neuronex19.html.

[65] **Joshua T. Vogelstein**, *Hayden Helm*, *Ronak Mehta*, Carey E. Priebe, and Raman Arora. "A Theory and Practice of the Lifelong Learnable". In: L2M, Sept. 2019. URL: https://neurodata.io/talks/L2F_18mo.html.

[64] **Joshua T. Vogelstein** and Randal Burns. "Data Science Core". In: Harvard University, July 2019. URL: https://neurodata.io/talks/ZZ_MSCZ_U19.pptx.

[63] James Browne. "Forest Packing: Fast Parallel, Decision Forests". In: SIAM International Conference on Data Mining, May 2019. URL: https://neurodata.io/talks/ForestPacking2019JamesBrowne.pptx.

[62] Daniel Tward. "Brain mapping tools for neuroscience research". In: NeuroNex, May 2019. URL: https://neurodata.io/talks/tward_neuronex2.pdf.

[61] **Joshua T. Vogelstein**. "Big Data and the Life Sciences". In: Sloan Foundation, May 2019. URL: https://neurodata.io/talks/SloanFoundation2019.pptx.

[60] **Joshua T. Vogelstein**. "Journey to Here". In: JHU BMES talks, Apr. 2019. URL: https://neurodata.io/talks/jhu-bmes19.html.

[59] **Joshua T. Vogelstein**. "NeuroData (Science)". In: Kavli, Apr. 2019. URL: https://neurodata.io/talks/kavli19.html.

[58] **Joshua T. Vogelstein**. "Statistical Foundations For Connectomics". In: Max Planck / HHMI Connectomics Meeting, Apr. 2019. URL: https://neurodata.io/talks/connectomics19.html.

[57] **Joshua T. Vogelstein**. "Lifelong Learning Forests". In: L2M, Mar. 2019. URL: https://neurodata.io/talks/L2F_1yr.html.

[56] **Joshua T. Vogelstein**. "NeuroData Tools". In: NeuroData Hackashop, Mar. 2019. URL: https://neurodata.io/talks/tools19.html#1.

[55] **Joshua T. Vogelstein**. "Biomedical Big Data and Data Science". In: JHU BME, Feb. 2019. URL: https://neurodata.io/talks/datascience19.html.

[54] **Joshua T. Vogelstein**. "NeuroData: A Community-developed open-source computational ecosystem for big neuro data". In: NeuroNex, Oct. 2018. URL: https://neurodata.io/talks/neuronex18.html.

[53] C. Shen. "The Exact Equivalence of Distance and Kernel Methods for Hypothesis Testing". In: Joint Statistical Meeting, Aug. 2018.

[52] **Joshua T Vogelstein**. "Multiscale Graph Correlation: A Knowledge Representation System for Discovering Latent Geometric Structure". In: DARPA SIMPLEX PI Review Meeting, Aug. 2018. URL: https://neurodata.io/talks/mgc-simplex.html.

[51] **Joshua T. Vogelstein** and *Vikram Chandrashekhar*. "NeuroNex + Stanford". In: NeuroNex-Stanford, July 2018.

[50] **Joshua T. Vogelstein**. "Data Intensive Brain Science". In: Kavli Neuroscience Discovery Institute, June 2018.

[49] *Gregory Kiar*. "Connectome Coding: what is it, how do we do it, and why do we care?" In: Data science in Neuroscience Symposium, June 2018.

[48] **Joshua T. Vogelstein**. "Lifelong Learning Forests". In: Darpa L2M PI Meeting, June 2018.

[47] **Joshua T. Vogelstein**. "Engineering the Future of Medicine: Data Intensive Biomedical Science". In: Johns Hopkins University Biomedical Engineering, Mar. 2018.

[46] Disa Mhembere. "knor: a NUMA-Optimized In-Memory, Distributed and Semi-External-Memory k-means library". In: HPDC, June 2017. URL: https://github.com/neurodata/talks/blob/master/p67-mhembere.pdf.

[45] **Joshua T. Vogelstein**. "NeuroData". In: 2017.

[44] **Joshua T. Vogelstein**. "The International Brain Station (TIBS)". In: JHU BME and Tsinghua University, 2017.

[43] **Joshua T. Vogelstein**. "Connectome Coding". In: Schmidt Sciences, 2017.

[42] *Gregory Kiar*. "Science in the Cloud (SIC): A use-case in MRI Connectomics". In: Open Science Special Interest Group, 2017.

[41] Disa Mhembere. "knor: K-means NUMA Optimized Routines Library". In: High-Performance Parallel and Distributed Computing, 2017. DOI: 10.1145/3078597.3078607.

[40] *Youjin Lee*. "Network Dependence Testing via Diffusion Maps and Distance-Based Correlations". In: Joint Statistical Meetings, 2017.

[39] **Joshua T. Vogelstein**. "NeuroStorm". In: Global Brain Workshop 2 JHU, 2017.

[38] *T. M. Tomita*. "ROFLMAO: Robust Oblique Forests with Linear Matrix Operations". In: SIAM International Conference on Data Mining 2017, 2017. DOI: 10.1137/1.9781611974973.56.

[37] **Joshua T Vogelstein**. "Challenges and Opportunities in Big Data for Neuroscientists". In: Society for Neuroscience: DC Metro Area Chapter Keynote Address, 2017. URL: https://neurodata.io/talks/sfn17.html.

[36] C. Shen. "Multiscale Generalized Correlation". In: Joint Statistical Meeting, Aug. 2016.

[35] **Joshua T. Vogelstein**. "NeuroData:Enabling Terascale Neuroscience". In: JHU Kavli Neuroscience Discovery Institute, 2016.

[34] **Joshua T. Vogelstein**. "The International Brain Station (TIBS)". In: Kavli Foundation, 2016.

[33] **Joshua T. Vogelstein**. "NeuroData 2016". In: NeuroData Lab Retreat, 2016.

[32] **Joshua T. Vogelstein**. "Global Brain Workshop 2016". In: Global Brain Workshop NSF+JHU at Kavli, 2016.

[31] **Joshua T. Vogelstein**, Michael I. Miller, and Richard Hunganir. "Global Brain Workshop 2016". In: Kavli Neuroscience Discovery Institute & Center for Imaging Science @ JHU, 2016.

[30] **Joshua T. Vogelstein**. "Global Brain Workshop 2016". In: Kavli Neuroscience Discovery Institute & Center for Imaging Science, 2016.

[29] **Joshua T. Vogelstein**. "NeuroData:Enabling Terascale Neuroscience". In: Kavli Neuroscience Discovery Institute & Center for Imaging Science, 2016.

[28] **Joshua T. Vogelstein**. "Learning a Data-Driven Nosology:Progress, Challenges & Opportunities". In: Kavli Neuroscience Discovery Institute & Center for Imaging Science, 2016.

[27] **Joshua T. Vogelstein**. "The International Brain Station (TIBS)". In: United Nations Global Brain Workshop Meeting, 2016.

[26] C. Shen. "Local Distance Correlation for Testing Independence". In: Temple University, Nov. 2015.

[25] **Joshua T. Vogelstein**. "big time (series data in neuroscience)". In: figshare, 2015. URL: https://figshare.com/articles/big_time_series_data_for_neuroscience_/1591211.

[24] **Joshua T Vogelstein**. "Research Computing Support for Neuroscience and Other Life Sciences". In: CASC, 2015.

[23] **Joshua T Vogelstein**. "From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from Heterogeneous Data". In: SIMPLEX Kickoff, 2015.

[22] **Joshua T Vogelstein**. "From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from Heterogeneous Data: Part 1". In: DARPA SIMPLEX PI Meeting, 2015.

[21] **Joshua T Vogelstein**. "From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from Heterogeneous Data: Part 2". In: DARPA SIMPLEX PI Meeting, 2015.

[20] **Joshua T Vogelstein**. "Special Symposium: Neuroscience in the 21st Century". In: Kavli, 2015.

[19] **Joshua T Vogelstein**. "Law of Large Graphs". In: DARPA Graphs, 2015.

[18] **Joshua T Vogelstein**. "Open Connectome Project: Lowering the Barrier to Entry of Big Data Neuroscience". In: Institute for Computational Medicine at Johns Hopkins University, 2015.

[17] **Joshua T Vogelstein**. "Opportunities and Challenges in Big Data Neuroscience". In: DoE, 2015.

[16] **Joshua T. Vogelstein**. "Open Source Platform for Heterogenous Brain Data". In: figshare, 2015. URL: https://figshare.com/articles/Open_Source_Platform_for_Heterogeneous_Brain_Data/1381926.

[15] **Joshua T Vogelstein**. "Big Statistics for Brain Sciences". In: Baylor College of Medicine, Department of Neuroscience, May 2014.

[14] **Joshua T Vogelstein**. "Big (Neuro) Statistics". In: Kavli Salon: Big Data: Practice Across Disciplines, 2014. URL: http://figshare.com/articles/Big%5C_Neuro%5C_Statistics/1142907.

[13] **Joshua T Vogelstein**. "Open-Science Platform for Heterogeneous Brain Data: Opportunities and Challenges". In: Kavli, 2014.

[12] **Joshua T Vogelstein**. "Open Problems in Neuropsychiatry". In: Data Seminar, Duke University, 2013.

[11] **Joshua T Vogelstein**. "Statistical Models and Inference for big Brain-Graphs". In: NIPS Workshop on Acquiring and analyzing the activity of large neural ensembles, 2013.

[10] **Joshua T Vogelstein**. "Decision Theoretic Approach to Statistical Inference". In: guest Lecture in Current Topics in Machine Learning, Johns Hopkins University, 2012.

[9] **Joshua T Vogelstein**. "Open Connectome Project". In: Academic Medical Center, Amsterdam, 2012.

[8] **Joshua T Vogelstein**. "Are mental properties supervenient on brain properties". In: NIPS workshop on Philosophy and Machine Learning. 2011.

[7] **Joshua T Vogelstein**. "Consistent Graph Classification". In: Guest Lecture in Deisseroth Lab, Stanford University, 2011.

[6] **Joshua T Vogelstein**. "Neurocognitive Graph Theory". In: National Security Agency, 2009.

[5] **Joshua T Vogelstein**. "OOPSI: A Family of Optimal OPtical Spike Inference Algorithms for Inferring Neural Connectivity from Population Calcium Imaging". In: Dissertation Defense, 2009. URL: https://www.researchgate.net/publication/45657467%5C_OOPSI%5C_A%5C_family%5C_of%5C_optimal%5C_optical%5C_spike%5C_inference%5C_algorithms%5C_for%5C_inferring%5C_neural%5C_connectivity%5C_from%5C_population%5C_calcium%5C_imaging.

[4] **Joshua T Vogelstein**. "Sequential Monte Carlo in Neuroscience". In: SAMSI Program on Sequential Monte Carlo, Tracking Working Group, 2009.

[3] **Joshua T Vogelstein**. "Towards Inference and Analaysis of Neural Circuits Inferred from Population Calcium Imaging". In: Guest Lecture in Schnitzer Lab, 2009.

[2] **Joshua T Vogelstein**. "Towards Inferring Neural Circuits from Calcium Imaging". In: Guest Lecture in Yuste Lab, 2009.

[1] **Joshua T Vogelstein**. "Inferring spike times given typical time-series fluorescence observations". In: Department of Applied Mathematics and Statistics, Johns Hopkins University, 2008.

Interviews

Teaching Experience – Ongoing Courses

Fall '19 **NeuroData Design I**, *EN.580.237/437/637*, Course Director, enrollment 46.
Spring '19 **NeuroData Design II**, *EN.580.438/638*, Course Director, enrollment 18.
Fall '18 **NeuroData Design I**, *EN.580.237/437/637*, Course Director, enrollment 22.
Spring '17 **NeuroData Design II**, *EN.580.238/438/638*, Course Director, enrollment 14.
Winter '17 **BME Research Intersession**, *EN.580.574*, Course Director, enrollment 6.
Fall '17 **NeuroData Design I**, *EN.580.247/437/637*, Course Director, enrollment 15.
Spring '16 **The Art of Data Science**, *EN.580.468*, Course Director, enrollment 24.
Fall '16 **NeuroData Design I**, *EN.580.437*, Course Director, enrollment 16.
Fall '15 **Introduction to Computational Medicine**, Co-Teaching, Course Co-Director.
Spring '15 **Statistical Connectomics**, *EN.580.694*, Course Director, enrollment 26.

Teaching Experience – One-Time

Spring '19 **Systems Bioengineering II**, *EN.580.422*, 2 Lectures.
Spring '19 **Computational Neuroscience**, *AS.080.321*, 2 Lectures.
Spring '18 **Systems Bioengineering II**, *EN.580.422*, 2 Lectures.
Spring '18 **Computational Neuroscience**, *AS.080.321*, 2 Lectures.
Spring '17 **Systems Bioengineering II**, *EN.580.422*, 2 Lectures.
Spring '16 **Systems Bioengineering II**, *EN.580.422*, 2 Lectures.
Winter '16 **Introduction to Connectomics**, *EN.600.221*, 1 Lecture.
Fall '16 **BME Modeling and Design**, *EN.580.111*, 1 Lecture.

Advisory Information

Post-Doctoral Fellows

08/18 – now **Jesús Arroyo, PhD**, *Post-doctoral Fellow*, CIS, JHU.
Working on graph matching and joint graph embedding.

07/19 – now **Celine Drieu, PhD**, *Post-doctoral Fellow*, Kavli NDI, JHU.
Co-Advised by Assitant Prof. Kuchibhotla, Department of Psychological and Brain Sciences. Working on understanding learning and memory using two-photon calcium imaging.

07/19 – now **Austin Grave, PhD**, *Post-doctoral Fellow*, Kavli NDI, JHU.
Co-Advised by Prof. Richard Huganir, Department of Neuroscience. Working on understanding whole brain synaptic plasticity using genetic engineering and light microscopy imaging.

07/18 – now **Audrey Branch, PhD**, *Post-doctoral Fellow*, Kavli NDI, JHU.
Co-Advised by Prof Michela Gallagher, extending brain clearing experimental technology from mice to rats. Currently with a manuscript on biorxiv.

09/16 – 08/18 **Cencheng Shen, PhD**, *Post-Doctoral Fellow*, CIS, JHU.
Developed Multiscale Graph Correlation, which is currently the premiere hypothesis testing framework, and about to be integrated into SciPy, by far the world's leading scientific computing package. Currently an Assistent Professor in Department of Statistics at University of Delaware, and still an actice collaborator and grantee.

05/16 – 06/17 **Leo Duan, PhD**, *Post-doctoral Fellow*, CIS, JHU.
Went on to do a second postdoc with Leo Dunson (who I did my second postdoc with). Currently an Assistant Professor at University of Florida.

06/16 – 07/17 **Guilherme Franca, PhD**, *Post-doctoral Fellow*, CIS, JHU.
Worked on non-parametric clustering, with an article about to be accepted in PAMI, the leading machine learning journal. Currently a postdoc for Rene Vidal.

Ph.D. Students

08/19 – now **Michael Powell, MSE**, *PhD advisee*, BME, JHU.
Dissertation will focus on explainable artificial intelligence, spearheads collaboration with Andreas Muller, Co-Director of scikit-learn, the world's leading machine learning package.

06/19 – now **Jaewon Chung, MSE**, *PhD advisee*, BME, JHU.
Dissertation will focus on statistics of populations of human networks. Already co-first author and middle author on multiple manuscripts.

08/19 – now **Tommy Athey, BSE**, *PhD advisee*, BME, JHU.
Dissertation will focus on MouseLight project, spearheads collaborations with Prof. Jeremias Sulam and Michael I. Miller.

08/19 – now **Eric Bridgeford, BSE**, *PhD advisee*, Department of Biostatistics, JHU.
Dissertation will focus on statistics of human connectomes and mitigating batch effects. Already first author on several manuscripts under review, and spearheads collaboration with Prof Brian Caffo at Biostatistics.

08/18 – now **Benjamin Pedigo, BSE**, *PhD advisee*, BME, JHU.
Dissertation will focus on analysis and modeling of the world's first whole animal connectome, in collaboration with Marta Zlatic and Albert Cardona (formerly of Janelia Research Campus). Already co-first author and middle author on multiple manuscripts.

08/18 – now **Meghana Madyastha, BSE**, *PhD Co-advisee*, CS, JHU.
Dissertation will focus on computational aspects of accelerationg learning and inference using decision forests.

08/16 – now **Vikram Chandrashekhar, BSE**, *PhD advisee*, BME, JHU.
Dissertation has focused on extending LDDMM to whole cleared brain datasets, spearheads collaboration with Prof. Karl Deisseroth's lab at Stanford, one of the world's leading neuroscientists.

08/14 – 01/18 **Tyler Tomita, PhD**, BME, JHU.
Developed Sparse Projection Oblique Randomer Forest in his dissertation, currently the best performing machine learning algorithm on a standard suite of over 100 benchmark problems. Currenly a postdoc with Assistant Prof. Chris Honey of Psychology and Brain Sciences.

M.S. Students

06/19 – now **Bijan Varjavand**, *MS advisee*, BME, JHU.
Submitted manuscript to PAMI on advancing statistics on populations of networks.

06/19 – now **Sambit Panda**, *MS advisee*, BME, JHU.
Led development of Python implementation of MGC, to be integrated into SciPy.

06/19 – now **Varun Kotharkar**, *MS advisee*, AMS, JHU.
Investigating theoretical advantages of oblique, as compared to axis-aligned, decision trees.

06/18 – now **Drishti Mannan**, *MS advisee*, BME, JHU.
Preparing manuscript introducing novel specification for large attributed networks.

06/18 – 05/19 **Jaewon Chung**, *MSE advisee*, BME, JHU.
Co-first author of manuscript and co-lead developer of Python package for statistical analysis of networks. Currently a BME PhD student in my lab.

08/14 – 06/17 **Greg Kiar, MSE**, BME, JHU.
Lead deveoper of NDMG, the only existing "soup to nuts" pipeline for both functional and diffusion pipelines; co-first author of manuscript under review. Currently a PhD student at McGill University.

Undergraduate Students (BME unless otherwise noted)

06/19 – now **Vivek Gopalakrishnan**, *BSE*, BME, JHU.
Winner of Pistritto Fellowship.

06/19 – now **Richard Guo**, *BSE*, BME, JHU.

06/19 – now **Ronan Perry**, *BSE*, BME, JHU.

08/14 – 08/18 **Eric Bridgeford, BSE**, BME, JHU.
Currently a PhD student in Biostatistics at JHSPH in my lab.

08/15 – 08/16 **Albert Lee,BSE**, BME, JHU.

06/15 – 12/15 **Ron Boger, BSE**, BME, JHU.
Currenly working at a computational medicine start-up in Silicon Valley.

05/15 – 05/16 **Jordan Matelsky, BSE**, CS and Neuroscience, JHU.
Currently a data scientist at APL.

02/15 – 05/16 **Ivan Kuznetsov, BSE**, BME, JHU.
Currently an MD/PhD Candidate at the UPenn, winner of Soros Fellowship.

Research Assistants

09/19 – now **Ross Lawrence**, *Research Assistant*, BME, JHU.
Responsible for documenting and bug fixing NDMG.

07/19 – now **Ronak Mehta**, *Research Assistant*, BME, JHU.
Finalizing three manuscripts on (1) uncertainty forests, (2) time-series dependence quantification, and (3) lifelong learning forests.

06/19 – now **Devin Crowley**, *Research Assistant*, BME, JHU.
Lead developer of our scalable Python implementaiton of LDDMM.

02/19 – now **Hayden Helm**, *Assistant Research Faculty*, BME, JHU.
Leading research efforts developing theory and methods for lifelong learning.

10/18 – now **Alex Loftus**, *Research Assistant*, BME, JHU.
Current lead developer of NDMG, transitioning from a stand-alone package to be integrated with DiPy.

06/18 – now **Benjamin Falk**, *Research Engineer*, BME, JHU.
Lead software engineer, overseas all development projects, solely responsible for all cloud infrastructure.

03/16 – now **Jesse Patsolic**, *Assistant Research Faculty*, BME, JHU.
Lead developer converting our extensions to decision forests to be merged into sklearn.

Summer Interns

Summer '19 **Kareef Ullah**, *Summer Intern*, BME, JHU.

Summer '19 **Shunan Wu**, *Summer Intern*, BME, JHU.

Summer '19 **Shiyu Sun**, *Summer Intern*, BME, JHU.

Summer '19 **Sander Shulhoff**, *Summer Intern*, BME, JHU.

Summer '19 **Kiki Zhang**, *Summer Intern*, BME, JHU.

Summer '18 **Papa Kobina Van Dyck**, *Summer Intern*, BME, JHU.

Thesis Committee Service

Kutten, Kwame, *JHU Ph.D. Student*, Graduated 2018.

Browne, James, *Computer Science*, JHU Ph.D. Student, Graduated 2019.
Mhembere, Disa, *Computer Science*, JHU Ph.D. Student, Graduated 2019.
Zheng, D, *Computer Science*, JHU Ph.D. Student, Graduated 2017.
Wang, Shangsi, *Applied Mathematics and Statistics*, JHU Ph.D. Student, Graduated 2018.
Tang, Runze, *Applied Mathematics and Statistics*, JHU Ph.D. Student, Graduated 2018.
Lee, Youjin, *Biostatistics*, JHU Ph.D. Student, Graduated 2018.
Binkiewicz, Norbert, *Statistics*, University of Wisconsin Ph.D. Student, Graduated 2017.
Gray-Roncal, Will, *Computer Science*, JHU Ph.D. Student, Graduated 2016.

Research

A table showing my direct (total) cost expentidures since being hired is below, indicating a steady increase each year of over 30%. Details for funding sources follow, including the average annual direct (total) costs per grant, when available.

FY15: $113,761 ($168,924),
FY16: $360,123 ($524,225),
FY17: $459,523 ($709,019),
FY18: $550,011 ($887,186),
FY19: $850,836 ($1,366,308).

External Research Support: Current

9/19 – 8/22 **NIH**, Mueller (PI), *Accessible technologies for high-throughput, whole-brain reconstructions of molecularly characterized mammalian neurons P0* The goal of this grant will be to develop scalable and affordable cellular imaging and neuro-informatics tools, running preliminary experiments to connect the transcriptome to anatomy, in mice. Tools will be made available to researchers, to help accelerate the creation of detailed maps at cell resolution showing circuitry in whole brains..
JTV is responsible for all big data infrastructure and informatics.

12/19 – 11/23 **DARPA GARD**, Arora (PI), *Understanding and improving robust learning against adversarial attacks.*.
JTV is responsible for theory, methods, and algorithms using decision forests.

12/19 – 11/23 **NIH**, Badea (PI), *Brain Networks in Mouse Models of Aging.* The goal of this grant it to generate connectomes and RNA-seq transcriptomes to characterize and differentiate APOE mice as a model of aging..
JTV is responsible for all statistical analyses, particularly associated with connectomics.

8/19 – 5/24 **NIH 1R01MH120482-01**, *$73,570*, Satterthwaite (PI), *Reproducible imaging-based brain growth charts for psychiatry.* This goal of this proposal will have provide a new data resource, yield reproducible growth charts of brain development, and delineate novel mechanisms regarding the developmental basis of psychopathology in youth..
JTV is responsible for all statistical analyses, particularly associated with connectomics.

5/17 – 4/20 **NSF 1712947**, Shen (PI), Multiscale Generalized Correlation: A Unified Distance-Based Correlation Measure for Dependence Discovery The goal of this proposal is to establish a unified methodology framework for statistical testing in high-dimensional, noisy, big data, through theoretical advancements, comprehensive simulations, and real data experiments.
JTV is responsible for working with the PI on all aspects of methods development and assessments, as well as all real data applications.

7/17 – 6/20 **NIH 1R01DC016784-01**, Ratnanather (PI), CRCNS US-German Res Prop: functional computational anatomy of the auditory cortex. The goal of this project is to create a robust computational framework for analyzing the cortical ribbon in a specific region: the auditory cortex.
JTV is responsible for the big data aspects of this grant, including data sharing and open access properties.

10/16 – 9/20 **DARPA D3M FA8750-17-2-0112**, Priebe (PI), *What Would Tukey Do?* The goal is to develop theory and methods for generating a discoverable archive of data modeling primitives and for automatically selecting model primitives and for composing selected primitives into complex modeling pipelines based on user-specified data and outcome(s) of interest.
JTV is responsible for connecting methods to real data applications, specifically in brain science.

9/17 – 8/22 **NIH U19 1U19NS104653-01**, *$67,209 ($110,055)*, Engert (PI), Sensorimotor processing, decision-making, and internal states: towards a realistic multiscale circuit model of the larval zebrafish brain. The general goal of the proposal is to generate a realistic multiscale circuit model of the larval zebrafish's brain – the multiscale virtual fish (MSVF). The model will span spatial ranges from the nanoscale at the synaptic level, to local microcircuits to inter-area connectivity - and its ultimate purpose is to explain and simulate the quantitative and qualitative nature of behavioral output across various timescales.
JTV is the PI of the Data Core, and therefore responsible for all aspects of data, including, storage, analysis, modeling, and disseminating.
The above grant is the flagship NIH BRAIN Initiative granting mechanism. In addition to being the PI of the Data Core, I am the co-chair of the consortium of U19 Data Science Cores.

1/18 – 12/19 **Schmidt Sciences**, *$125,000*, Vogelstein (PI), *Connectome Coding at the Synaptic Scale*. This project will study learning and plasticity at an unprecedented scale, revealing the dynamics of large populations of synapses comprising an entire local cortical circuit. No previously conducted experiment could answer the questions about the dynamics of large populations of synapses, which is crucial to understanding the learning process.

11/17 – 10/21 **DARPA L2M**, *$2,000,000*, Vogelstein (PI), *Lifelong Learning Forests*. Our Lifelong Learning Forests (L2Fs) will learn continuously, selectively adapting to new environments and circumstances utilizing top-down feedback to impact low-level processing, with provable statistical guarantees, while maintaining computational tractability at scale. .

11/17 – 10/21 **DARPA L2M**, *$19,940*, Tolias (PI), *Continual Learning Across Synapses, Circuits, and Brain Areas*. Our goal is to develop the pre-processing analysis pipeline for the imaging data collected in this project.
JTV is responsible for all informatics associated with data management, visualization, processing, and analysis starting in Phase II of the program.

7/18 – 6/21 **NSF**, *$599,757*, Shulman (PI), SemiSynBio: Collaborative Research: YeastOns: Neural Networks Implemented in Communication Yeast Cells. Our goal is to provide neuroscience and machine learning expertise to guide the design of the computational learning capabilities of the system.
JTV is responsible for providing insight into both biological and artificial neural network architecture and function.

7/17 – 6/20 **NSF, NeuroNex 16-569 Neural System Cluster 1707298**, *$400,000*, Vogelstein (PI), NeuroNex Innovation Award: Towards Automatic Analysis of Multi-Terabyte Cleared Brains..
The goal of this project is to develop an end-to-end pipeline for the analysis of big brain volume data in the cloud.
The above grant is the flagship NSF BRAIN Initiative granting mechanism.

External Research Support: Completed

10/17 – 9/18 **Dog Star Technologies, 90074647**, *$48,151 ($78,849)*, Vogelstein (PI), Brain Ark.
JTV is responsible for estimating the connectomes from four coyotes and four sea lions.

1/17 – 2/18 **Kavli Foundation**, *$50,000*, Vogelstein (PI), International Brain Station.
JTV is responsible establishing the foundations of what could become an international brain station.

1/17 – 10/18 **NSF EAGER**, *$24,188*, Burns (PI), ACI-1649880, Brain Comp Infra: EAGER: BrainLab CI: Collaborative, Community Experiments with Data-Quality Controls through Continuous Integration.
JTV is responsible for integrating and applying this work in the context of brain science numerical experiments.

4/16 – 3/19 **NSF 1637376**, *$120,000*, Vogelstein (PI), A Scientific Planning Workshop for Coordinating Brain Research Around the Globe.
JTV is responsible for organizing this series of meetings held at JHU, including the first ever international brain initiative workshop.

5/15 – 8/18 **DARPA SIMPLEX N66001-15-C-4041**, *$65,842 ($106,665)*, Vogelstein (PI), *From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from Heterogenous Data.*.

9/14 – 6/19 **NIH Director's Transformative Research Award R01NS092474**, *$116,838 ($189,278)*, Smith (PI), Synaptomes of Mouse and Man.
JTV is responsible for all statistical analyses of data.
The above award is part of the High-Risk, High-Reward Research program directly from the NIH Director's budget. It is the largest and most prestigious award given by NIH.

5/14 – 2/16 **DARPA (GRAPHS), DARPA-BAA-13-15**, *$38,060 ($61,658)*, Burns (PI), *Scalable Brain Graph Analyses Using Big-Memory, High-IOPS Compute Architectures.*.
JTV is responsible for motivating and applying methods development for brain graph data.

3/13 – 1/16 **NIH/NSF (BIGDATA), 1R01DA036400**, Mitra (PI), Computational infrastructure for massive neuroscience image stacks.
JTV is responsible for computational infrastructure and statistical analysis.

2/13 – 9/15 **Endeavor Scientists Training Fellowship**, Child Mind Institute, Vogelstein (PI).

9/12 – 8/15 **NIH/NIBIB (CRCNS), 1R01EB016411**, *$42,190 $52,979)*, Burns (PI), Data Sharing: The EM Open Connectome Project.
JTV is responsible all aspects of this grant that relate to brain science (as compared to computer science).

1/14 – 12/14 **Laboratory for Analytic Sciences**, Harer (PI), *Data Readiness Level.*
JTV is responsible for applications to brain science.

1/12 – 10/13 **DARPA (XDATA), FA8750-12-C-0239**, *$111,467 ($165,477)*, Andrews (PI), *Graph-Based Scalable Analytics for Big Data.*.
JTV is responsible to acquiring and cleaning big brain network data.

12/09 – 1/13 **NSF**, RJ Vogelstein (PI), *National Center for Applied Neuroscience Project.*.
JTV is responsbile for developing statistical connectomics methods.

Service

Department Service

Winter '19 **Organizer**, *Decision Forest Hackathon.*

Summer '19 **Organizer**, *NeuroData Workshop*, `https://neurodata.devpost.com`, Hackashop to train brain scientists in machine learning for big data ()∼ 50 participants from around the country)..

March '19 **Organizer**, *Neuro Reproducibility Hackashop*, `https://brainx3.io/`, Hackashop to train brain scientists in best practices in reproducible science, co-organized with two startups: Vathes, LLC and Gigantum (∼ 50 participants).

Spring '18 **Organizer**, *NeuroData Hackathon.*

Fall '17 **Organizer**, *NeuroData Mini-Hackathon.*

Summer '17 **Organizer**, *NeuroStorm*, `https://brainx2.io`, Workshop bring together thought leaders from academia, national labs, industry, and non-profits around the world to take next steps towards accelerating brain science discovery in the cloud (∼ 50 participants and 5 observers from funding institutions).

Winter '15 **Organizer**, *Hack@NeuroData*, `http://hack.neurodata.io/`.

University Service

2019 **Member**, *Search Committee*, BME, Neuroengineering, 2019.

2019 **Member**, *Search Committee*, BME, Data Science, 2019.

2018 **Member**, *Search Committee*, BME, Neuroengineering, 2018.

Winter '17 **Faculty Superviser**, *MedHacks*, `http://medhacks.org/`.

Winter '16 **Faculty Superviser**, *MedHacks*, `http://medhacks.org/`.

Spring '16 **Organizer**, *Global Brain Workshop*, `http://brainx.io`, First ever international Brain Initiative workshop, bringing together leaders from around the world, covered by Nature and Science (∼ 75 participants).

Winter '15 **Faculty Superviser**, *MedHacks*, `http://medhacks.org/`.

Professional Service

Fall '16 **Co-Organizer**, *Brains and Bits: Neuroscience Meets Machine Learning, NIPS Workshop*, http://www.stat.ucla.edu/~akfletcher/brainsbits_overview.html.

Fall '15 **Co-Organizer**, *BigNeuro2015: Making Sense of Big Neural Data, NIPS Workshop*, http://neurodata.io/bigneuro2015.

Fall '12 **Co-Organizer**, *Scaling up EM Connectomics Conference*, The world's first connectomics workshop, now run annually alternating between Janelia Research and Max Plank locations ($\sim$ 80 participants).

Other Scholarly and Technical Output

Boards

10/18 – now **Advisory Board**, *Mind-X*.

01/17 – now **Advisory Board**, *PivotalPath*.

Consultancy

2017 **Consultant**, *Greenspring Associates*.

2016 **Consultant**, *Scanadu*.

Other Roles in Companies