Assistant Professor,
Department of Biomedical Engineering
Johns Hopkins University
✉ *jovo@jhu.edu*
jovo.me

Joshua T. Vogelstein

Professional Experience

09/19 – **Joint Appointment**, *Department of Biostatistics*, Johns Hopkins University, Baltimore, MD, USA.

08/18 – **Director of Biomedical Data Science Focus Area**, *Department of Biomedical Engineering*, Johns Hopkins University, Baltimore, MD, USA.

01/17 – **Co-Founder**, *gigantum*, Washington, MD, USA.

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

01/16 – **Co-Founder**, *d8alab*, Baltimore, MD, USA.

08/15 – **Joint Appointment**, *Department of Applied Mathematics and Statistics*, JHU, Baltimore, MD, USA.

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

08/15 – 07/18 **Co-Developer**, *Computational Medicine Minor*, JHU, Baltimore, MD, USA.

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

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

08/14 – **Core Faculty**, *Institute for Computational Medicine*, JHU, Baltimore, MD, USA.

08/14 – **Core Faculty**, *Center for Imaging Science*, JHU, Baltimore, MD, USA.

08/14 – **Assistant Research Faculty**, *Human Language Technology Center of Excellence*, JHU, Baltimore, MD, USA.

08/14 – **Joint Appointment**, *Department of Neuroscience*, JHU, Baltimore, MD, USA.

08/14 – **Joint Appointment**, *Department of Computer Science*, JHU, Baltimore, MD, USA.

08/14 – **Assistant Professor**, *Department of Biomedical Engineering*, JHU, Baltimore, MD, USA.

10/12 – 08/14 **Endeavor Scientist**, *Child Mind Institute*, New York, NY, USA.

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

08/12 – 08/14 **Adjunct Faculty**, *Department of Computer Science*, JHU, Baltimore, MD, USA.

10/12 – **Affiliated Faculty**, *Institute for Data Intensive Engineering and Sciences*, JHU, Baltimore, MD, USA.

12/09 – 01/11 **Post-Doctoral Fellow**, *Department of Applied Mathematics and Statistics*, Supervised by Carey E. Priebe, JHU, Baltimore, MD, USA.
Research Statistics of populations of networks.

06/01 – 09/01 **Research Assistant**, *Prof. Randy O'Reilly, Dept. of Psychology*, University of Colorado, Denver, CO, USA.

06/00 – 09/00 **Clinical Engineer**, *Johns Hopkins Hospital*, JHU, Baltimore, MD, USA.

06/99 – 08/99 **Research Assistant under Dr. Jeffrey Williams**, *Dept. of Neurosurgery, Johns Hopkins Hospital*, Baltimore, MD, USA.

06/98 – 08/98 **Research Assistant under Professor Kathy Cho**, *Dept. of Pathology, Johns Hopkins School of Medicine*, Baltimore, MD, USA.

Education

2003 – 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 – 2009 **M.S. in Applied Mathematics & Statistics**, *Johns Hopkins University*.

1998 – 2002 **B.A. in Biomedical Engineering**, *Washington University, St. Louis*.

Awards and Recognition

Individual

2002 **Dean's List**, *Washington University*.

Shared

2019 **Kavli NDI Distinguished Postdoctoral Fellow**, *Celine Drieu, PhD*.

2019 **Kavli NDI Distinguished Postdoctoral Fellow**, *Austin Graves, PhD*.

2019 **Winner of Pistritto Fellowship.**, *Vivek Gopalakrishnan*.

2017 **Kavli NDI Distinguished Postdoctoral Fellow**, *Audrey Branch, PhD*.

2017 **Best Presentation Award HPDC**, *Mhembere et al. (2017)*.

2017 **Nonparametric Statistics of the American Statistical Association Student Paper Award**, *Lee et al. (2017)*.

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)*.

Other Media

2020 **A. Mandavilli**, *Coronavirus Can Set Off a 'Cytokine Storm.' These Drugs May Calm It*, NYT.

2020 **A. Mone**, *Researchers Urge Clinical Trial of Blood Pressure Drug to Prevent Lethal Complication of Covid-19*, Johns Hopkins Medicine.

2020 **M. Rosen**, *Preventing 'Cytokine Storm' May Ease Severe COVID-19 Symptoms*, HHMI.

2020 **J. Hamblin**, *Why Some People Get Sicker Than Others*, The Atlantic.

2020 **S. Salzberg**, *Prazosin Might Be A Treatment For COVID-19. More Data Is Urgently Needed*, Forbes.

2019 **Johns Hopkins Medicine**, *BME Pioneers: Joshua Vogelstein*, BME Pioneers.

2019 **Johns Hopkins Medicine**, *Technology Connecting the Brain to the Human Experience*.

2018 **J. M. Perkel.**, *Web service makes big data available to neuroscientists*, Nature.

2016 **Emerging Technology from the arXiv**, *Three Grand Challenges for Brain Science That Can Be Solved in 10 Years*, MIT.

2016 **P. Patel.**, *Johns Hopkins researchers want to use big data to chart the brain*, Johns Hopkins University.

2016 **S. Reardon.**, *Worldwide brain-mapping project sparks excitement — an concern*, Nature.

2016 **E. Underwood.**, *International brain projects proposed*, Science.

2016 **National Institutes of Health**, *International Brain Projects Considered*, BRAIN initiative.

2016 **Office of the Spokesperson**, *International Brain Initiative Launch and VIP Dialog: Towards an International Brain Station*, US Department of State.

2016 **The Kavli Foundation**, *International Brain Initiative*, Kavli.

2015 **Dale Keiger**, *The Open Connectome Project takes a close look at the brain*, Johns Hopkins Magazine.

2014 **S. Begley**, *Fly brain 'atlas' opens door to linking human neurons to actions*, Reuters.

2014 **L. Gatlin**, *Johns Hopkins mathematician receives grant to support study of brain's circuitry*, Johns Hopkins University.

2014 **T. O'Leary and E. Marder**, *Mapping Neural Activation onto Behavior in an Entire Animal*, Science.

2014 **L. Sanders**, *Ten thousand neurons linked to behaviors in fly*, ScienceNews.

2014 **D. Son and J. Lee**, *Research Highlights*, Nature.

2014 **K. Yandell**, *Linking Neurons to Behaviors*, TheScientist.

2014 **B. Yirka**, *Researchers create a reference atlas for neural circuits in fruit fly larvae*, MedicalXpress.

2012 **C. B. Begg and M. C. Pike**, *Comment on "The Predictive Capacity of Personal Genome Sequencing"*, Science.

2012 **B. Thomas**, *"Open Access to the Brain" – Podcast 1: Joshua Vogelstein*, The Connectome Podcast.

2012 **E. J. Topol**, *Comment on "The Predictive Capacity of Personal Genome Sequencing"*, Science.

Professional/Social Media Presence

@neuro_data, Twitter account with a approximately 7,000 followers, over 250K impressions in December 2019, and approximately 100 new followers, and upwards of 100 new tweets, per month, and 25 link clicks per day. Follower demographics include $< 50\%$ high school graduates, 46% female.

Bits and Brains, Professional blog reguarding all things academic, neurological, and statistical, with approximately 30 blog posts, approximately one new post per month (9,000 page views, 3,200 unique users)
Most Popular Post: 10 Simple Rules to Write a Paper from Start to Finish.

Professional Memberships

2015 – **Society for Neuroscience**, *SFN*.

Published Peer-Reviewed Research Articles

Note: CV author in bold; Trainees are underlined,
(73 papers; top 10 cited 3,922 times; H-index 36; 12 first, 13 last, 48 middle authorships) as of 2021/01/15

[73] Michael P. Milham, **Joshua T. Vogelstein**, and Ting Xu. "Removing the Reliability Bottleneck in Functional Magnetic Resonance Imaging Research to Achieve Clinical Utility". In: *JAMA Psychiatry* (Jan. 2021). DOI: 10.1001/jamapsychiatry.2020.4272. URL: https://jamanetwork.com/journals/jamapsychiatry/article-abstract/2774875.

[72] Seok-Jun Hong, Ting Xu, Aki Nikolaidis, Jonathan Smallwood, Daniel S. Margulies, Boris Bernhardt, **Joshua T. Vogelstein**, and Michael P. Milham. "Toward a connectivity gradient-based framework for reproducible biomarker discovery". In: *NeuroImage* 223 (Dec. 2020), p. 117322. ISSN: 1053-8119. DOI: https://doi.org/10.1016/j.neuroimage.2020.117322. URL: http://www.sciencedirect.com/science/article/pii/S1053811920308089.

[71] Ting Xu, Karl-Heinz Nenning, Ernst Schwartz, Seok-Jun Hong, **Joshua T. Vogelstein**, Alexandros Goulas, 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: *NeuroImage* 223 (Dec. 2020), p. 117346. ISSN: 1053-8119. DOI: https://doi.org/10.1016/j.neuroimage.2020.117346. URL: http://www.sciencedirect.com/science/article/pii/S1053811920308326.

[70] Jae Wook Chow, Annachiara Korchmaros, **Joshua T. Vogelstein**, Michael P. Milham, and Ting Xu. "Impact of concatenating fMRI data on reliability for functional connectomics". In: *Neuroimage* (Nov. 2020). DOI: https://doi.org/10.1016/j.neuroimage.2020.117549.

[69] 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. "Variability and heritability of mouse brain structure: Microscopic MRI atlases and connectomes for diverse strains". In: *NeuroImage (Cover Story)* 222 (Nov. 2020), p. 117274. ISSN: 1053-8119. DOI: https://doi.org/10.1016/j.neuroimage.2020.117274. URL: http://www.sciencedirect.com/science/article/pii/S1053811920307606.

[68] Karl-Heinz Nenning, Ting Xu, Ernst Schwartz, Jesus Arroyo, Adelheid Woehrer, Alexandre R. Franco, **Joshua T. Vogelstein**, Daniel S. Margulies, Hesheng Liu, Jonathan Smallwood, Michael P. Milham, and Georg Langs. "Joint embedding: A scalable alignment to compare individuals in a connectivity space". In: *NeuroImage* 222 (Nov. 2020), p. 117232. ISSN: 1053-8119. DOI: https://doi.org/10.1016/j.neuroimage.2020.117232. URL: http://www.sciencedirect.com/science/article/pii/S1053811920307187.

[67] Cencheng Shen and **Joshua T. Vogelstein**. "The exact equivalence of distance and kernel methods in hypothesis testing". In: *AStA Advances in Statistical Analysis* (Sept. 2020). DOI: 10.1007/s10182-020-00378-1. URL: https://doi.org/10.1007/s10182-020-00378-1.

[66] Melissa A Haendel, Christopher G Chute, Tellen D Bennett, David A Eichmann, Justin Guinney, Warren A Kibbe, Philip R O Payne, Emily R Pfaff, Peter N Robinson, Joel H Saltz, Heidi Spratt, Christine Suver, John Wilbanks, Adam B Wilcox, Andrew E Williams, Chunlei Wu, Clair Blacketer, Robert L Bradford, James J Cimino, Marshall Clark, Evan W Colmenares, Patricia A Francis, Davera Gabriel, Alexis Graves, Raju Hemadri, Stephanie S Hong, George Hripscak, Dazhi Jiao, Jeffrey G Klann, Kristin Kostka, Adam M Lee, Harold P Lehmann, Lora Lingrey, Robert T Miller, Michele Morris, Shawn N Murphy, Karthik Natarajan, Matvey B Palchuk, Usman Sheikh, Harold Solbrig, Shyam Visweswaran, Anita Walden, Kellie M Walters, Griffin M Weber, Xiaohan Tanner Zhang, Richard L Zhu, Benjamin Amor, Andrew T Girvin, Amin Manna, Nabeel Qureshi, Michael G Kurilla, Sam G Michael, Lili M Portilla, Joni L Rutter, Christopher P Austin, and the N3C Consortium Gersing Ken R. "The National COVID Cohort Collaborative (N3C): Rationale, design, infrastructure, and deployment". In: *Journal of the American Medical Informatics Association* (Aug. 2020). ocaa196. ISSN: 1527-974X. DOI: 10.1093/jamia/ocaa196. eprint: https://academic.oup.com/jamia/advance-article-pdf/doi/10.1093/jamia/ocaa196/34927041/ocaa196.pdf. URL: https://doi.org/10.1093/jamia/ocaa196.

[65] Marc-Andre Schulz, B.T. Thomas Yeo, **Joshua T. Vogelstein**, Janaina Mourao-Miranada, Jakob N. Kather, Konrad Kording, Blake Richards, and Danilo Bzdok. "Different scaling of linear models and deep learning in UKBiobank brain images versus machine-learning datasets". In: *Nat Commun* (Aug. 2020). DOI: 10.1038/s41467-020-18037-z. URL: https://doi.org/10.1038/s41467-020-18037-z.

[64] 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: *The Canadian Journal of Statistics* (Aug. 2020). DOI: https://doi.org/10.1002/cjs.11591.

[63] Meghana Madhyastha, Gongkai Li, Veronika Strnadov-Neeley, James Browne, **Joshua T. Vogelstein**, Randal Burns, and Carey E. Priebe. "Geodesic Forests". In: KDD '20 (Aug. 2020), pp. 513–523. DOI: 10.1145/3394486.3403094. URL: https://doi.org/10.1145/3394486.3403094.

[62] Marc-Ander Schulz, B.T. Thomas Yeo, **Joshua T. Vogelstein**, Janaina Mourao-Miranda, Jakob N. Kather, Konrad Kording, Blake Richards, and Danilo Bzdok. "Different scalling of linear models and deep learning in UKBiobank brain images versus machine-learning datasets". In: *Nat Commun* 11 (Aug. 2020). DOI: 10.1038/s41467-020-18037-z.

[61] Adam S. Charles, Benjamin Falk, Nicholas Turner, Talmo D. Pereira, Daniel Tward, Benjamin D. Pedigo, Jaewon Chung, Randal Burns, Satrajit S. Ghosh, Justus M. Kebschull, William Silversmith, and Joshua T. Vogelstein. "Toward Community-Driven Big Open Brain Science: Open Big Data and Tools for Structure, Function, and Genetics". In: *Annual Review of Neuroscience* 43.1 (July 2020), pp. 441–464. DOI: 10.1146/annurev-neuro-100119-110036. eprint: https://doi.org/10.1146/annurev-neuro-100119-110036. URL: https://doi.org/10.1146/annurev-neuro-100119-110036.

[60] Maximilian F. Konig, Mike Powell, Verena Staedtke, Ren-Yuan Bai, David L. Thomas, Nicole Fischer, Sakibul Huq, Adham M. Khalafallah, Allison Koenecke, Ruoxuan Xiong, Brett Mensh, Nickolas Papadopoulos, Kenneth W. Kinzler, Bert Vogelstein, **Joshua T. Vogelstein**, Susan Athey, Shibin Zhou, and Chetan Bettegowda. "Preventing cytokine storm syndrome in COVID-19 using alpha-1 adrenergic receptor antagonists". In: *The Journal of Clinical Investigation* 130.7 (July 2020), pp. 3345–3347. DOI: 10.1172/JCI139642. URL: https://doi.org/10.1172/JCI139642.

[59] 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: *Journal of Machine Learninig Research* (May 2020). URL: http://arxiv.org/abs/1506.03410.

[58] Guilherme Franca, Maria Rizzo, and **Joshua T. Vogelstein**. "Kernel k-Groups via Hartigan's Method". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* PP (May 2020), pp. 1–1. DOI: 10.1109/TPAMI.2020.2998120.

[57] Seok-Jun Hong, **Joshua T. Vogelstein**, Alessandro Gozzi, Boris C. Bernhardt, B.T. Thomas Yeo, Michael P. Milham, and Adriana Di Martino. "Toward Neurosubtypes in Autism". In: *Biological Psychiatry* 88.1 (Apr. 2020). Convergence and Heterogeneity in Psychopathology, pp. 111–128. ISSN: 0006-3223. DOI: https://doi.org/10.1016/j.biopsych.2020.03.022. URL: http://www.sciencedirect.com/science/article/pii/S0006322320314979.

[56] 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: *NeuroImage* (Feb. 2020). URL: https://doi.org/10.1016/j.neuroimage.2020.116678.

[55] 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.

[54] 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 (Aug. 2019). URL: http://arxiv.org/abs/1703.03862.

[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. eprint: https://arxiv.org/abs/1904.05329. URL: http://jmlr.org/papers/v20/19-490.html.

[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* (Aug. 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 (Aug. 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 (Aug. 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: 2047-217X. 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: 0167-8655. DOI: 10.1016/J.PATREC.2016.12.012. URL: https://www.sciencedirect.com/science/article/pii/S0167865516303671.

[40] 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 (2017). ISSN: 2373-2822. DOI: 10.1523/ENEURO.0195-17.2017. eprint: 1604.03629. URL: https://doi.org/10.1523/ENEURO.0195-17.2017.

[39] 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). DOI: 10.1371/journal.pcbi.1005493. URL: https://doi.org/10.1371/journal.pcbi.1005493.

[38] 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.

[37] 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.

[36] Norbert Binkiewicz, **Joshua T. Vogelstein**, and Karl 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.

[35] 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.

[34] 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.

[33] 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.

[32] 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: 1556-4681. DOI: 10.1145/2824443. URL: http://doi.acm.org/10.1145/2824443.

[31] 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.

[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 (Aug. 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. eprint: 1507.08376. 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: 0018-9294. 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. eprint: NIHMS150003. URL: https://doi.org/10.1038/nmeth.2482.

[15] **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.

[14] 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.

[13] 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/.

[12] 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.

[11] 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 (2012), pp. 1445–1457. ISSN: 09328092. DOI: 10.1007/s00138-012-0462-0. URL: https://doi.org/10.1007/s00138-012-0462-0.

[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: 0895-4798. 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 (2009), 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 Paninski. "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

[21] Meghana Madhyastha, Gongkai Li, Veronika Strnadová-Neeley, James Browne, Joshua T. Vogelstein, Randal Burns, and Carey E. Priebe. "Geodesic Forests". In: Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining. KDD '20. Virtual Event, CA, USA: Association for Computing Machinery, Aug. 2020, pp. 513–523. ISBN: 9781450379984. DOI: 10.1145/3394486.3403094. URL: https://doi.org/10.1145/3394486.3403094.

[20] 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), pp. 343–392. DOI: 10.1101/343392. URL: https://doi.org/10.1101/343392.

[19] 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* (June 2018), pp. 46–54. DOI: 10.1137/1.9781611975673.6. arXiv: 1806.07300. URL: https://arxiv.org/abs/1806.07300.

[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), pp. 223–233. DOI: 10.1109/eScience.2018.00037. URL: https://ieeexplore.ieee.org/abstract/document/8588656.

[17] 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 2017). arXiv: 1604.06414. URL: http://arxiv.org/abs/1604.06414.

[16] 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)* (2017). Ed. by Maxime Descoteaux, Lena Maier-Hein, Alfred Franz, Pierre Jannin, D. Louis Collins, and Simon Duchesne, 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_32.

[15] 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.

[14] 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. URL: https://doi.org/10.1137/1.9781611974973.56.

[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. URL: http://arxiv.org/abs/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. ISBN: 9781931971201. DOI: 10.1109/ICDE.2012.28. eprint: 1408.0500. URL: http://arxiv.org/abs/1408.0500.

[10] 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. IEEE, Dec. 2013, pp. 313–316. ISBN: 9781479902484. DOI: 10.1109/GlobalSIP.2013.6736878. eprint: 1312.4875. URL: http://ieeexplore.ieee.org/document/6736878/.

[9] 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://dx.doi.org/10.1109/GlobalSIP.2013.6736874.

[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: 978-1-4503-1921-8. DOI: 10.1145/2484838.2484870. arXiv: 1306.3543. URL: http://arxiv.org/abs/1306.3543.

[7] David E Carlson, Vinayak Rao, **Joshua T Vogelstein**, and Lawrence Carin. "Real-Time Inference for a Gamma Process Model of Neural Spiking". In: *Advances in Neural Information Processing Systems 26* (2013). ISSN: 10495258. URL: http://papers.nips.cc/paper/5061-real-time-inference-for-a-gamma-process-model-of-neural-spiking.pdf.

[6] 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: *18th International Conference on Digital Signal Processing* (2013). DOI: 10.1109/ICDSP.2013.6622710. eprint: 1304.5894. URL: http://arxiv.org/abs/1304.5894.

[5] 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. eprint: arXiv. URL: http://papers.nips.cc/paper/4925-robust-multimodal-graph-matching-sparse-coding-meets-graph-matching.

[4] 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.

[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: Brain and Health Informatics. 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

[1] **Joshua T Vogelstein**, RJ Vogelstein, and Carey E Priebe. "A Neurocognitive Graph-Theoretical Approach to Understanding the Relationship Between Minds and Brains". In: CSHL conference on Neural Circuits. 2010.

Manuscripts Not Yet Accepted

[32] Vivek Gopalakrishnan, Jaewon Chung, Eric Bridgeford, Benjamin D. Pedigo, Jesús Arroyo, Lucy Upchurch, G. Allan Johnsom, Nian Wang, Youngser Park, Carey E. Priebe, and **Joshua T. Vogelstein**. "Multiscale Comparative Connectomics". In: *arXiv* (Dec. 2020). eprint: 2011.14990. URL: https://arxiv.org/abs/2011.14990.

[31] Liam Rose, Laura Graham, Allison Koenecke, Michael Powell, Ruoxuan Xiong, Zhu Shen, Kenneth W. Kinzler, Chetan Bettegowda, Bert Vogelstein, Maximilian F. Konig, Susan Athey, **Joshua T. Vogelstein**, and Todd H. Wagner. "The Association Between Alpha-1 Adrenergic Receptor Antagonists and In-Hospital Mortality from COVID-19". In: *medRxiv* (Dec. 2020). DOI: 10.1101/2020.12.18.20248346. eprint: https://www.medrxiv.org/content/early/2020/12/22/2020.12.18.20248346.full.pdf. URL: https://www.medrxiv.org/content/early/2020/12/22/2020.12.18.20248346.

[30] Hayden S. Helm, Ronak D. Mehta, Brandon Duderstadt, Weiwei Yang, Christoper M. White, Ali Geisa, **Joshua T. Vogelstein**, and Carey E. Priebe. "A partition-based similarity for classification distributions". In: *arXiv* (Nov. 2020). eprint: 2011.06557. URL: https://arxiv.org/abs/2011.06557.

[29] Michael Powell, Allison Koenecke, James Byrd, Akihiko Nishimura, Maximilian Konig, Ruoxuan Xiong, Sadiqa Mahmood, Vera Mucaj, Chetan Bettegowda, Liam Rose, Suzanne Tamang, Adam Sacarny, Brian Caffo, Susan Athey, Elizabeth Stuart, and **Joshua Vogelstein**. "A How-To Guide for Conducting Retrospective Analyses: Example COVID-19 Study". In: *Plos CB* (Nov. 2020). eprint: OSFPreprints. URL: https://osf.io/3drch.

[28] Guodong Chen, Jesús Arroyo, Avanti Athreya, Joshua Cape, **Joshua T. Vogelstein**, Youngser Park, Chris White, Jonathan Larson, Weiwei Yang, and Carey E. Priebe. "Multiple Network Embedding for Anomaly Detection in Time Series of Graphs". In: (Aug. 2020). arXiv: 2008.10055 [stat.ME]. URL: https://arxiv.org/abs/2008.10055.

[27] Eric W. Bridgeford, Shangsi Wang, Zhi Yang, Zeyi Wang, Ting Xu, Cameron Craddock, Jayanta Dey, Gregory Kiar, William Gray-Roncal, Carlo Coulantoni, Christopher Douville, Carey E. Priebe, Brian Caffo, Michael Milham, Xi-Nian Zuo, and **Joshua T. Vogelstein**. "Eliminating accidental deviations to minimize generalization error with applications in connectomics and genomics". In: *bioRxiv* (Aug. 2020). DOI: 10.1101/802629. eprint: https://www.biorxiv.org/content/early/2020/08/20/802629.full.pdf. URL: https://www.biorxiv.org/content/early/2020/08/20/802629.

[26] Ketan Mehta, Rebecca F. Goldin, David Marchette, Joshua T. Vogelstein, Carey E. Priebe, and Giorgio A. Ascoli. "Neuronal Classification from Network Connectivity via Adjacency Spectral Embedding". In: *bioRxiv* (June 2020). DOI: 10.1101/2020.06.18.160259. eprint: https://www.biorxiv.org/content/early/2020/06/20/2020.06.18.160259.full.pdf. URL: https://www.biorxiv.org/content/early/2020/06/20/2020.06.18.160259.

[25] Carey E. Priebe, Joshua T. Vogelstein, Florian Engert, and Christopher M. White. "Modern Machine Learning: Partition & Vote". In: *bioRxiv* (May 2020). DOI: 10.1101/2020.04.29.068460. eprint: https://www.biorxiv.org/content/early/2020/05/17/2020.04.29.068460.full.pdf. URL: https://www.biorxiv.org/content/early/2020/05/17/2020.04.29.068460.

[24] Allison Koenecke, Michael Powell, Ruoxuan Xiong, Zhu Shen, Nicole Fischer, Sakibul Huq, Adham M. Khalafallah, Marco Trevisan, Pr Sparen, Juan J Carrero, Akihiko Nishimura, Brian Caffo, Elizabeth A. Stuart, Renyuan Bai, Verena Staedtke, Nickolas Papadopoulos, Kenneth W. Kinzler, Bert Vogelstein, Shibin Zhou, Chetan Bettegowda, Maximilian F. Konig, Brett Mensh, **Joshua T. Vogelstein**, and Susan Athey. "Alpha-1 adrenergic receptor antagonists to prevent hyperinflammation and death from lower respiratory tract infection". In: *arXiv*, arXiv:2004.10117 (Apr. 2020), arXiv:2004.10117. arXiv: 2004.10117 [q-bio.TO].

[23] Tyler M. Tomita and **Joshua T. Vogelstein**. "Robust Similarity and Distance Learning via Decision Forests". In: (2020). arXiv: 2007.13843 [stat.ML]. URL: https://arxiv.org/abs/2007.13843.

[22] Ronan Perry, Gavin Mischler, Richard Guo, Theodore Lee, Alexander Chang, Arman Koul, Cameron Franz, and **Joshua T. Vogelstein**. "mvlearn: Multiview Machine Learning in Python". In: (2020). arXiv: 2005.11890 [stat.ML]. URL: https://arxiv.org/abs/2005.11890.

[21] **Joshua T. Vogelstein**, Hayden S. Helm, Ronak D. Mehta, Jayanta Dey, Will LeVine, Weiwei Yang, Bryan Tower, Jonathan Larson, Chris White, and Carey E. Priebe. "A general approach to progressive learning". In: (2020). arXiv: 2004.12908 [cs.AI]. URL: https://arxiv.org/abs/2004.12908.

[20] Maximilian Konig, Mike Powell, Verena Staedtke, Ren-Yuan Bai, David L. Thomas, Nicole Fischer, Sakibul Huq, Adaham M. Khalafallah, Allison Koenecke, Ruoxuan Xiong, Brett Mensh, Nickolas Papadopoulos, Kenneth W. Kinzler, Bert Vogelstein, **Joshua T. Vogelstein**, Susan Athey, Shibin Zhou, and Chetan Bettegowda. "Targeting the catecholamine-cytokine axis to prevent SARS-CoV-2 cytokine storm syndrome". In: *medRxiv* (2020). DOI: 10.1101/2020.04.02.20051565. URL: https://www.medrxiv.org/content/10.1101/2020.04.02.20051565v2.

[19] Cencheng Shen and **Joshua T Vogelstein**. "The Chi-Square Test of Distance Correlation". In: (Dec. 2019). arXiv: 1912.12150 [stat.ML].

[18] 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.

[17] 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, (CoRR), 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.

[16] 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.

[15] 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.

[14] Cencheng Shen and **Joshua T. Vogelstein**. "The Exact Equivalence of Distance and Kernel Methods for Hypothesis Testing". In: *arXiv* (July 2019). URL: https://arxiv.org/abs/1806.05514.

[13] Ronak Mehta, Richard Guo, Jesus Arroyo, Mike Powell, Hayden Helm, Cencheng Shen, and **Joshua T. Vogelstein**. "Estimating Information-Theoretic Quantities with Uncertainty Forests". In: *arXiv e-prints*, arXiv:1907.00325 (June 2019), arXiv:1907.00325. arXiv: 1907.00325 [cs.LG].

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

[11] 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.

[10] 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.

[9] 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.

[8] Heather Patsolic, Sancar Adali, **Joshua T. Vogelstein**, Youngser Park, Carey E. Priebe, Gongki Li, and Vince Lyzinski. "Seeded Graph Matching Via Joint Optimization of Fidelity and Commensurability". In: *arXiv* (Jan. 2019). eprint: 1401.3813. URL: http://arxiv.org/abs/1401.3813.

[7] 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://doi.org/10.1101/639674.

[6] Thomas L. Athey and Joshua T. Vogelstein. "AutoGMM: Automatic Gaussian Mixture Modeling in Python". In: *arxiv* (2019). DOI: 1909.02688. URL: https://arxiv.org/abs/1909.02688.

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

[4] 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://doi.org/10.1101/479055.

[3] **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.

[2] 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.

[1] 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.

Technical Reports

[15] Jaewon Chung, Eric Bridgeford, Jesus Arroyo, Benjamin D. Pedigo, Ali Saad-Eldin, Vivek Gopalakrishnan, Liang Xiang, Carey E. Priebe, and **Joshua Vogelstein**. "Statistical Connectomics". In: *arXiv* (Aug. 2020). URL: https://osf.io/ek4n3.

[14] **Joshua T. Vogelstein**. "P-Values in a Post-Truth World". In: (July 2020). arXiv: 2007.03611 [physics.soc-ph]. URL: https://arxiv.org/abs/2007.03611.

[13] Hayden S. Helm, Amitabh Basu, Avanti Athreya, Youngser Park, **Joshua T. Vogelstein**, Michael Winding, Marta Zlatic, Albert Cardona, Patrick Bourke, Jonathan Larson, Chris White, and Carey E. Priebe. "Learning to rank via combining representations". In: (May 2020). arXiv: 2005.10700. URL: https://arxiv.org/abs/2005.10700.

[12] Polina Golland, Jack Gallant, Greg Hager, Hanspeter Pfister, Christos Papadimitriou, Stefan Schaal, and **Joshua T. Vogelstein**. "A New Age of Computing and the Brain". In: (Apr. 2020). arXiv: 2004.12926 [cs.CY]. URL: https://arxiv.org/abs/2004.12926.

[11] Zeyi Wang, Eric Bridgeford, Shangsi Wang, **Joshua T. Vogelstein**, and Brian Caffo. "Statistical Analysis of Data Repeatability Measures". In: (2020). arXiv: 2005.11911 [stat.AP]. URL: https://arxiv.org/abs/2005.11911.

[10] 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.

[9] Gregory Kiar, Eric Bridgeford, Will Gray Roncal, (CoRR), 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://doi.org/10.1101/188706.

[8] Gregory Kiar, Robert J. Anderson, Alex Baden, Alexandra Badea, Eric W. Bridgeford, Andrew Champion, Vikram Chandrashekhar, Forrest Collman, Brandon Duderstadt, Alan C. Evans, Florian Engert, Benjamin Falk, Tristan Glatard, William R. Gray Roncal, David N. Kennedy, Jeremy Maitin-Shepard, Ryan A. Marren, Onyeka Nnaemeka, Eric Perlman, Sharmishtaas Seshamani, Eric T. Trautman, Daniel J. Tward, Pedro Antonio Valdés-Sosa, Qing Wang, Michael I. Miller, Randal Burns, and **Joshua T. Vogelstein**. "NeuroStorm: Accelerating Brain Science Discovery in the Cloud". In: *arXiv* (Mar. 2018). arXiv: 1803.03367. URL: http://arxiv.org/abs/1803.03367.

[7] Gregory Kiar, Eric 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://doi.org/10.1101/188706.

[6] Carey E. Priebe, Youngser Park, Minh Tang, Avanti Athreya, Vince Lyzinski, **Joshua T. Vogelstein**, Yichen Qin, Ben Cocanougher, Katharina Eichler, Marta Zlatic, and Albert Cardona. "Semiparametric spectral modeling of the Drosophila connectome". In: *arXiv* (2017). arXiv: 1705.03297. URL: http://arxiv.org/abs/1705.03297.

[5] Da Zheng, Disa Mhembere, **Joshua T. Vogelstein**, Carey E. Priebe, and Randal Burns. "FlashR: R-Programmed Parallel and Scalable Machine Learning using SSDs". In: *CoRR, abs/1604.06414* (2017). arXiv: 1604.06414. URL: http://arxiv.org/abs/1604.06414.

[4] Da Zheng, Randal Burns, **Joshua Vogelstein**, Carey E. Priebe, and Alexander S. Szalay. "An SSD-based eigensolver for spectral analysis on billion-node graphs". In: *arXiv* (2016). arXiv: 1602.01421. URL: http://arxiv.org/abs/1602.01421.

[3] A Sinha, WG Roncal, and N Kasthuri. "Automatic Annotation of Axoplasmic Reticula in Pursuit of Connectomes". In: *arXiv* (2014). arXiv: arXiv:1404.4800. URL: http://arxiv.org/abs/1404.4800.

[2] Michael Kazhdan, Randal Burns, Bobby Kasthuri, Jeff Lichtman, Jacob Vogelstein, and **Joshua Vogelstein**. "Gradient-Domain Processing for Large EM Image Stacks". In: *arXiv* (Sept. 2013). arXiv: 1310.0041. URL: http://arxiv.org/abs/1310.0041.

[1] Anjishnu Banerjee, **Joshua Vogelstein**, and David Dunson. "Parallel inversion of huge covariance matrices". In: *arXiv* 1312.1869 (2013). arXiv: 1312.1869. URL: http://arxiv.org/abs/1312.1869.

Other Publications

[10] Eric W Bridgeford, Daniel Sussman, Vince Lyzinski, Yichen Qin, Youngser Park, Brian Caffo, Carey E Priebe, and **Joshua T Vogelstein**. "What is Connectome Coding?" In: *SfN 2018 course book* (2018). URL: https://neurodata.io/talks/sfn_2018_coursebook.pdf.

[9] Jonathan Caplis and Joshua T Vogelstein. Glass box vs. black box. https://www.pionline.com/article/20170727/ONLINE/170729878/glass-box-vs-black-box. July 2017.

[8] **Joshua T. Vogelstein**, Katrin Amunts, Andreas Andreou, Dora Angelaki, Giorgio A. Ascoli, Cori Bargmann, Randal Burns, Corrado Cali, Frances Chance, George Church, Hollis Cline, Todd Coleman, Winfried Stephanie de La Rochefoucauld Denk, Ana Belén Elgoyhen, Ralph Etienne Cummings, Alan Evans, Kenneth Harris, Michael Hausser, Sean Hill, Samuel Inverso, Chad Jackson, Viren Jain, Rob Kass, Bobby Kasthuri, Adam Kepecs, Gregory Kiar, Konrad Kording, Sandhya P. Koushika, John Krakauer, Story Landis, Jeff Layton, Qingming Luo, Adam Marblestone, David Markowitz, Justin McArthur, Brett Mensh, Michael P. Milham, Partha Mitra, Pedja Neskovic, Miguel Nicolelis, Richard O'Brien, Aude Oliva, Gergo Orban,

Hanchuan Peng, Eric Perlman, Marina Picciotto, Mu-Ming Poo, Jean-Baptiste Poline, Alexandre Pouget, Sridhar Raghavachari, Jane Roskams, Alyssa Picchini Schaffer, Terry Sejnowski, Friedrich T. Sommer, Nelson Spruston, Larry Swanson, Arthur Toga, R. Jacob Vogelstein, Anthony Zador, Richard Huganir, and Michael I. Miller. Grand challenges for global brain sciences. 2016. DOI: 10.12688/f1000research.10025.1. URL: https://f1000research.com/articles/5-2873/v1.

[7] **Joshua T. Vogelstein**, Brett Mensh, Michael Häusser, Nelson Spruston, Alan C. Evans, Konrad Kording, Katrin Amunts, Christoph Ebell, Jeff Muller, Martin Telefont, Sean Hill, Sandhya P. Koushika, Corrado Calì, Pedro Antonio Valdés-Sosa, Peter B. Littlewood, Christof Koch, Stephan Saalfeld, Adam Kepecs, Hanchuan Peng, Yaroslav O. Halchenko, Gregory Kiar, Mu Ming Poo, Jean Baptiste Poline, Michael P. Milham, Alyssa Picchini Schaffer, Rafi Gidron, Hideyuki Okano, Vince D. Calhoun, Miyoung Chun, Dean M. Kleissas, R. Jacob Vogelstein, Eric Perlman, Randal Burns, Richard Huganir, and Michael I. Miller. "To the Cloud! A Grassroots Proposal to Accelerate Brain Science Discovery". In: *Neuron* 92.3 (2016), pp. 622–627. ISSN: 10974199. DOI: 10.1016/j.neuron.2016.10.033. URL: http://dx.doi.org/10.1016/j.neuron.2016.10.033.

[6] Polina Golland, Jack Gallant, Greg Hager, Hanspeter Pfister, Christos Papadimitriou, Stefan Schaal, and **Joshua T Vogelstein**. A New Age of Computing and the Brain: Report of the CCC Brain Workshop. 2014. URL: https://dl.acm.org/citation.cfm?id=2837681.

[5] Randal Burns, **Joshua T. Vogelstein**, and Alexander S. Szalay. "From cosmos to connectomes: The evolution of data-intensive science". In: *Neuron* 83.6 (2014), pp. 1249–1252. ISSN: 10974199. DOI: 10.1016/j.neuron.2014.08.045. eprint: 1304.0542.

[4] **Joshua T Vogelstein**. "Q and A: What is the Open Connectome Project?" In: *Neural Systems and Circuits* 1.1 (2011). ISSN: 2042-1001. DOI: 10.1186/2042-1001-1-16. URL: http://neuralsystemsandcircuits.biomedcentral.com/articles/10.1186/2042-1001-1-16.

[3] Rafael Yuste, Jason MacLean, **Joshua Vogelstein**, and Liam Paninski. "Imaging action potentials with calcium indicators". In: *Cold Spring Harbor Protocols* 6.8 (2011), pp. 985–989. ISSN: 15596095. DOI: 10.1101/pdb.prot5650. URL: http://cshprotocols.cshlp.org/content/2011/8/pdb.prot5650.full.pdf+html.

[2] **Joshua T Vogelstein**. "Oopsi: a family of optimal optical spike inference algorithms for inferring neural connectivity from population calcium imaging". In: *Learning* (2009). URL: https://www.researchgate.net/profile/Joshua_Vogelstein2/publication/45657467_OOPSI_A_family_of_optimal_optical_spike_inference_algorithms_for_inferring_neural_connectivity_from_population_calcium_imaging/links/00b7d536f73b4445c1000000.pdf.

[1] **J. T. Vogelstein**, Jacob V. Vogelstein, and Bert Vogelstein. "NIH Grant Application Testing the effects of genetic variations using MINIME technology". In: *Science* 286.5448 (Dec. 1999), pp. 2300–2301. ISSN: 00368075. DOI: 10.1126/science.286.5448.2300. URL: http://www.sciencemag.org/cgi/doi/10.1126/science.286.5448.2300.

Invited Talks

[37] **Joshua T. Vogelstein**. "Lifelong Learning". In: North Carolina State University, Raleigh, NC, USA, Oct. 2020.

[36] **Joshua T. Vogelstein**. "Lifelong Learning". In: Morgan State University, Baltimore, MD, USA, Sept. 2020.

[35] **Joshua T. Vogelstein**. "Lifelong Learning: Moving Beyond Avoiding Catastrophic Forgetting". In: Johns Hopkins Mathematical Institute for Data Science, Baltimore, MD, USA, Feb. 2020.

[34] **Joshua T. Vogelstein**. "Open Access to the Brain: a Computer "Connectome" Links Brain Images in Fine Detail". In: JHM Boot Camp, Baltimore, MD, USA, June 2019.

[33] **Joshua T. Vogelstein**. "Big Biomedical Data Science". In: Sol Goldman International Conference, Baltimore, MD, USA, Apr. 2019.

[32] **Joshua T. Vogelstein**. "Journey to Here". In: JHU BMES talks, Baltimore, MD, USA, Apr. 2019.

[31] **Joshua T. Vogelstein**. "NeuroData (Science)". In: Kavli, Baltimore, MD, USA, Apr. 2019.

[30] **Joshua T. Vogelstein**. "NeuroData Tools". In: NeuroData Hackashop, Baltimore, MD, USA, Mar. 2019.

[29] **Joshua T. Vogelstein**. "Biomedical Big Data and Data Science". In: JHU BME, Baltimore, MD, USA, Feb. 2019.

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

[27] **Joshua T. Vogelstein**. "Using Big Data Science to Understand What Goes On in our Heads". In: SOHOP Faculty Spotlight, Baltimore, MD, USA, Apr. 2018.

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

[25] **Joshua T Vogelstein**. "Data Coordination and Data Resources for the BRAIN Initiative". In: 4th Annual BRAIN Initiative Investigators Meeting, Rockville, MD, USA, 2018.

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

[23] **Joshua T. Vogelstein**. "Opportunities and Challenges in Big Data Neuroscience". In: Society for Neuroscience, Washington D.C., USA, 2017.

[22] **Joshua T Vogelstein**. "Using Big Data Science to Understand What Goes on in Our Heads". In: SOHOP Faculty Spotlight, Baltimore, MD, USA, 2017.

[21] **Joshua T. Vogelstein**. "NeuroStorm". In: Global Brain Workshop 2 JHU, Baltimore, MD, USA, 2017.

[20] **Joshua T Vogelstein**. "Challenges and Opportunities in Big Data for Neuroscientists". In: Society for Neuroscience: DC Metro Area Chapter Keynote Address, Washington, DC, USA, 2017.

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

[18] **Joshua T Vogelstein**. "Using Big Data Science to Understand What Goes on in Our Heads". In: SOHOP Faculty Spotlight, Baltimore, MD, USA, 2016.

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

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

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

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

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

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

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

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

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

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

[7] **Joshua T. Vogelstein**. "Open Source Platform for Heterogenous Brain Data". In: figshare, 2015.

[6] **Joshua T Vogelstein**. "Big (Neuro) Statistics". In: Kavli Salon, Chicago, IL, USA: Big Data: Practice Across Disciplines, 2014.

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

[4] **Joshua T Vogelstein**. "Decision Theoretic Approach to Statistical Inference". In: Guest Lecture in Current Topics in Machine Learning, Johns Hopkins University, Baltimore, MD, USA, 2012.

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

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

Other Talks

[69] **Joshua Vogelstein**. "The role of the connectome in achieving artificial general intelligence". In: Yale School of Medicine, Whistler Scientific Workshop, Whistler, BC, Canada, Mar. 2020.

[68] **Joshua Vogelstein**. "Lifelong Learning via Ensembling General Representations". In: Microsoft Research. Feb. 2020.

[67] Hayden Helm, Ronak Mehta, Carey E. Priebe, Raman Arora, and **Joshua T. Vogelstein**. "A Theory and Practice of Lifelong Learnable Forest". In: Kavli Neural Systems Institute, Rockefeller University, New York City, NY, USA, Jan. 2020.

[66] **Joshua T. Vogelstein**. "Lifelong Learning". In: Columbia University, New York City, NY, USA, Jan. 2020.

[65] **Joshua T. Vogelstein**. "Ailey in an Hour: (A "Soup-to-Nuts" Pipeline for Analysis of Whole Cleared Brain Data)". In: NeuroNex, Cornell University, Ithaca, NY, USA, Oct. 2019.

[64] **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.

[63] **Joshua T. Vogelstein** and Randal Burns. "Data Science Core". In: Harvard University, Carmridge, MA, USA, July 2019.

[62] Jaewon Chung. "Statistical Methods for Population of Connectomes". In: Organization of Human Brain Mapping, Rome, Italy, June 2019.

[61] James Browne. "Forest Packing: Fast Parallel, Decision Forests". In: SIAM International Conference on Data Mining, Calgary, Alberta, Canada, May 2019.

[60] Daniel Tward. "Brain mapping tools for neuroscience research". In: NeuroNex, Cornell University, Ithaca, NY, USA, May 2019.

[59] **Joshua T. Vogelstein**. "Big Data and the Life Sciences". In: Sloan Foundation, New York City, NY, USA, May 2019.

[58] **Joshua T. Vogelstein**. "Statistical Foundations For Connectomics". In: Max Planck / HHMI Connectomics Meeting, Berlin, Germany, Apr. 2019.

[57] **Joshua T. Vogelstein**. "Connectal Coding". In: Dipy Workshop, Bloomington, Indiana, USA, Mar. 2019.

[56] **Joshua T. Vogelstein**. "Lifelong Learning Forests". In: L2M, Mar. 2019.

[55] **Joshua T. Vogelstein**. "Connectome Coding". In: Society for Neuroscience, San Diego, CA, USA, Nov. 2018.

[54] **Joshua T. Vogelstein**. "NeuroData: A Community-developed open-source computational ecosystem for big neuro data". In: NeuroNex, Cornell University, Ithaca, NY, USA, Oct. 2018.

[53] **Joshua T Vogelstein**. "A Community-Developed Open-Source Computational Ecosystem for Big Neuro Data". In: Princeton University, Princeton, NJ, USA, Aug. 2018.

[52] **Joshua T Vogelstein**. "Multiscale Graph Correlation: A Knowledge Representation System for Discovering Latent Geometric Structure". In: DARPA SIMPLEX PI Review Meeting, New York City, NY, USA, Aug. 2018.

[51] Eric Perlman. "NeuroData: Embracing Open Source for Big Data Neuroscience". In: NSF NeuroNex Workshop on Super 3DEM, Austin, TX, USA, July 2018.

[50] Eric W Bridgeford. "A High-Throughput Pipeline Identifies Robust Connectomes but Troublesome Variability". In: Organization of Human Brain Mapping, Suntec, Singapore, July 2018.

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

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

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

[46] **Joshua T Vogelstein**. "Discovering Relationships and their Geometry Across Disparate Data Modalities". In: Yale University, New Haven, CT, USA, Jan. 2018.

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

[44] **Joshua T. Vogelstein**. "Discovering Relationships and their Geometry Across Disparate Data Modalities". In: Stanford University, Stanford, CA, US, Aug. 2017.

[43] Disa Mhembere. "knor: a NUMA-Optimized In-Memory, Distributed and Semi-External-Memory k-means library". In: HPDC, Washington DC, USA, June 2017.

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

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

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

[39] **Joshua T Vogelstein**. "NeuroData: Enabling Terascale Neuroscience for Everyone". In: 3rd Annual BRAIN Iniative Investigators Meeting, Bethesda, MD, USA, Dec. 2016.

[38] C. Shen. "Multiscale Generalized Correlation". In: Joint Statistical Meeting, Chicago, IL, USA, Aug. 2016.

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

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

[35] C. Shen. "Local Distance Correlation for Testing Independence". In: Temple University, Philadelphia, PA, USA, Nov. 2015.

[34] **Joshua T Vogelstein**. "Law of Large Graphs". In: DARPA Graphs, Columbia University, New York City, NY, USA, Sept. 2015.

[33] **Joshua T. Vogelstein**. "big time (series data in neuroscience)". In: figshare, 2015.

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

[31] **Joshua T Vogelstein**. "From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from Heterogeneous Data". In: SIMPLEX Kickoff, New York City, NY, USA, 2015.

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

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

[28] **Joshua T Vogelstein** and Liam Paninski. "Spike inference from calcium imaging using sequential Monte Carlo methods". In: AMSI Program on Sequential Monte Carlo, 2015.

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

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

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

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

[23] **Joshua T Vogelstein**. "Beyond Little Neuroscience". In: Beyond Optogenetics workshop at Cosyne, Salt Lake City, UT, USA, Feb. 2013.

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

[21] **Joshua T Vogelstein**. "Statistical Inference on Graphs". In: Scientific Computing Institute, University of Utah, Salt Lake City, UT, USA, 2013.

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

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

[18] **Joshua T Vogelstein**. "BIG NEURO". In: Theory and Neurobiology, Duke University, Durham, NC, USA, 2012.

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

[16] **Joshua T Vogelstein**. "Are mental properties supervenient on brain properties". In: NIPS workshop on Philosophy and Machine Learning, Sierra Nevada, Spain. Dec. 2011.

[15] **Joshua T Vogelstein**. "What can Translational neuroimaging Research do for Clinical Practice". In: Child Mind Institute, New York City, NY, USA, 2011.

[14] **Joshua T Vogelstein**. "Statistical Connectomics". In: Harvard University Connectomics Labs, Cambridge, MA, USA, 2011.

[13] **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, Fairfax, VA, USA, 2011.

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

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

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

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

[8] **Joshua T Vogelstein**. "OOPSI: A Family of Optimal OPtical Spike Inference Algorithms for Inferring Neural Connectivity from Population Calcium Imaging". In: Dissertation Defense, Johns Hopkins University, Baltimore, MD, USA, 2009.

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

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

[5] **Joshua T Vogelstein**. "Towards Inferring Neural Circuits from Calcium Imaging". In: Guest Lecture in Yuste Lab, Columbia University, New York City, NY, USA, 2009.

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

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

[2] **Joshua T Vogelstein**. "Inferring spike trains from Calcium Imaging". In: Cambridge University, Gatsby Unit, and University College London, Cambridge, England, 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, New York City, NY, USA, 2007.

Abstracts/Poster Presentations

[66] Eric W. Bridgeford, Michael Powell, Anton Alyakin, Brian Caffo, and **Joshua T. Vogelstein**. "Batch Effects are Causal Effects: Applications in Human Functional Connectomes". In: Neuromatch 3, Nov. 2020.

[65] Tingshan Liu, Benjamin D. Pedigo, Thomas L. Athey, and **Joshua T. Vogelstin**. "Hierarchical stochastic block modeling in the Drosophila connectome". In: Neuromatch 3, Nov. 2020.

[64] Ali Saad-Eldin, Benjamin D. Pedigo, Youngser Park, Carey E. Priebe, and **Joshua T. Vogelstein**. "NeuroGraphMatch". In: Neuromatch 3, Nov. 2020.

[63] Jaewon Chung, Jayanta Dey, Gregory Kiar, Carey E. Priebe, and **Joshua T. Vogelstein**. "Human Structural Connectomes are Heritable". In: Neuromatch 3, Nov. 2020.

[62] Benjamin D. Pedigo, Michael Winding, Ali Saad-Eldin, Tingshan Liu, Albert Cardona, Marta Zlatic, Carey E. Priebe, and **Joshua T. Vogelstein**. "Statistical tools for nanoscale connectomics: clustering neurons in Drosophila larva brain and other applications". In: Neuromatch 3, Nov. 2020.

[61] Ronan Perry, Jelle Zorn, Sebastien Czajko, Daniel S. Margulies, and **Joshua T. Vogelstein**. "Permutation-corrected independence testing for high-dimensional fMRI data". In: Neuromatch 3, Nov. 2020.

[60] Vivek Gopalakrishnan, Jaewon Chung, Eric Bridgeford, Jesus Arroyo, Benjamin D. Pedigo, Carey E. Priebe, and **Joshua T. Vogelstein**. "Statistical Methods for Multiscale Comparative Connectomics". In: Neuromatch 3, Nov. 2020.

[59] Thomas L Athey, Jeremias Sulam, **Joshua Vogelstein**, Daniel Tward, and Michael Miller. "Automated Neuron Tracing of Sparse Fluorescently Labeled Neurons". In: Neuromatch 3, Nov. 2020.

[58] Benjamin D Pedigo, Michael Winding, Turan Orujlu, Marta Zlatic, Albert Cardona, Carey E Priebe, and **Joshua T Vogelstein**. "A quantitative comparison of a complete connectome to artificial intelligence architectures". In: NAIsys, Cold Spring Harbor, NY, USA, Nov. 2020.

[57] **Joshua T. Vogelstein**, Hayden Helm, Benjamin D. Pedigo, Ronak Mehta, Carey E. Priebe, and Chris White. "A Biological Implementation of Lifelong Learning in the Pursuit of Artificial General Intelligence". In: NAIsys, Cold Spring Harbor, NY, USA, Nov. 2020.

[56] Jin Hecheng, Julian S.B. Ramirez, **Joshua T. Vogelstein**, Michael P. Milham, and Ting Xu. "Assessing functional connectivity beyond Pearson's correlation". In: Fairmont, Dallas, TX, USA, Sept. 2020.

[55] X Li, J.W. Cho, Michael P. Milham, and Ting Xu. "Improving brain-behavior prediction using individual-specific components from connectivity-based shared response model". In: Resting State, Fairmont, Dallas, TX, USA, Sept. 2020.

[54] J.W. Cho, A. Korchmaros, **Joshua T. Vogelstein**, Michael P. Milham, and Ting Xu. "Impact of Concatenating fMRI Data on reliability for Functional Connectomics". In: OHBM and Resting State, Fairmont, Dallas, TX, USA, June 2020.

[53] J.W. Cho, A. Korchmaros, **Joshua T. Vogelstein**, Michael P. Milham, and Ting Xu. "Developing a gradient flow framework to guide the optimization of reliability for the study of individual differences". In: OHBM and Resting State, Fairmont, Dallas, TX, USA, June 2020.

[52] Ronan Perry and **Joshua T. Vogelstein**. "Identifying Differences Between Expert and Novice Meditator Brain Scans via Multiview Embedding". In: OHBM, June 2020.

[51] Eric Bridgeford and **Joshua T. Vogelstein**. "Optimal Experimental Design for Big Data: Applications in Brain Imaging". In: OHBM, June 2020.

[50] Benjamin Falk and **Joshua T. Vogelstein**. "NeuroData's Open Data Cloud Ecosystem". In: Harvard University, Cambridge, MA, USA, July 2019. URL: https://neurodata.io/talks/25_NeuroDatas_Open_Data_Ecosystem.pdf.

[49] Jaewon Chung, Benjamin D. Pedigo, Carey E. Priebe, and **Joshua T. Vogelstein**. "Clustering Multi-Modal Connectomes". In: OHBM, Rome Italy, June 2019. URL: https://figshare.com/articles/Clustering_Multi-Modal_Connectomes/8309672.

[48] Jaewon Chung, Benjamin D. Pedigo, Carey E. Priebe, and **Joshua T. Vogelstein**. "Human Structural Connectomes are Heritable". In: OHBM, Rome Italy, June 2019. URL: https://figshare.com/articles/Structural_Connectomes_are_Heritable/7800587.

[47] 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, Calgary, Alberta, Canada, May 2019. URL: https://figshare.com/articles/Forest_Packing_Fast_Parallel_Decision_Forests/8194142.

[46] Thomas L. Athey and **Joshua T. Vogelstein**. "Low-level Neuron Segmentation in Sub-Micron Resolution Images of the Complete Mouse Brain". In: Brain Initiative Investigators Meeting, Washington DC, USA, Apr. 2019.

[45] Thomas L. Athey and **Joshua T. Vogelstein**. "Investigating Neuron Trajectories with Splines". In: Brain Initiative Investigators Meeting, Washington DC, USA, Apr. 2019.

[44] Benjamin D. Pedigo, Jaewon Chung, Eric W. Bridgeford, Bijan Varjavand, Carey E. Priebe, and **Joshua T. Vogelstein**. "GraSPy: an Open Source Python Package for Statistical Connectomics". In: Max Planck /HHMI Connectomics Meeting Berlin, Germany, Apr. 2019. URL: https://figshare.com/articles/GraSPy_an_Open_Source_Python_Package_for_Statistical_Connectomics/7982888.

[43] Eric Perlman. "NEURODATA: ENABLING BIG DATA NEUROSCIENCE". In: Kavli, Baltimore, MD, USA, 2017. URL: https://neurodata.io/talks/perlman_kndi_2017.pdf.

[42] Alex Baden, Eric Perlman, Forrest Collman, Stephen Smith, **Joshua T. Vogelstein**, and Randal Burns. "Processing and Analyzing Terascale Conjugate Array Tomography Data". In: Berlin, Germany, 2017. URL: https://neurodata.io/talks/berlin_2017.pdf.

[41] Stephen J. Smith, Randal Burns, Mark Chevillet, Ed Lein, Guillermo Sapiro, William Seeley, James Trimmer, **Joshua T Vogelstein**, and Richard Weinberg. "The Open Synaptome Project: Toward a Microscopy-Based Platform for Single-synapse Analysis of Diverse Populations of CNS Synapses". In: Society for Neuroscience, Chicago, IL, USA, Oct. 2015. URL: https://figshare.com/articles/Open_Synaptome_Project/1585165.

[40] **Joshua T Vogelstein**. "Open Connectome Project & NeuroData: Enabling Data-Driven Neuroscience at Scale". In: Society for Neuroscience, Chicago, IL, USA, Oct. 2015. URL: https://figshare.com/articles/NeuroData_amp_The_Open_Connectome_Project_Enabling_Big_Data_Neuroscience_at_Scale/1585167.

[39] Shaojie Chen, **Joshua T Vogelstein**, Seonjoo Lee, Martin Lindquist, and Brian Caffo. "High Dimensional State Space Model with L-1 and L-2 Penalties". In: ENAR 2015, Miami, FL, USA, Mar. 2015. URL: http://www.enar.org/abstracts/2015_Program_Abstracts_03-02-15.pdf.

[38] Shaojie Chen, Kai Liu, Yang Yuguang, Lee Seonjoo, Martin Lindquist, Brian Caffo, and **Joshua T Vogelstein**. "A Sparse High Dimensional State-Space Model with an Application to Neuroimaging Data". In: Figshare, 2015. URL: https://figshare.com/articles/A_Sparse_High_Dimensional_State_Space_Model_with_an_Application_to_Neuroimaging_Data/1515020.

[37] Shangsi Wang, Zhi Yang, Xi-Nian Zuo, Michael Milham, Cameron Craddock, Carey E. Priebe, and **Joshua T. Vogelstein**. "Optimal Design for Discovery Science: Applications in Neuroimaging". In: Figshare, 2015. URL: https://figshare.com/articles/Optimal_Design_for_Discovery_Science_Applications_in_Neuroimaging/1515021.

[36] Eva L. Deyer, Hugo L. Fernandes, Will Gray Roncal, Doga Gursoy, **Joshua T Vogelstein**, Xianghui Xiao, Chris Jacobsen, Konrad P. Kording, and Narayanan Kasthuri. "X-Brain: Quantifying Mesoscale Neuroanatomy Using X-ray Microtomography". In: Figshare, 2015. URL: https://figshare.com/articles/X_Brain_Quantifying_Mesoscale_Neuroanatomy_Using_X_Ray_Microtomography/1585163.

[35] Sharad Sikka, Brian Cheung, Ranjit Khanuja, Satra Ghosh, Chao-gan Yan, Qingyang Li, **Joshua Vogelstein**, Randal Burns, Stanley Colcombe, Cameron Craddock, Maarten Mennes, Clare Kelly, Adriana Dimartino, Francisco Castellanos, and Michael Milham. "Towards automated analysis of connectomes: The configurable pipeline for the analysis of connectomes (c-pac)". In: vol. 10. 5th INCF Congress of Neuroinformatics, Munich, Germany, Aug. 2014. URL: https://www.frontiersin.org/10.3389/conf.fninf.2014.08.00117/event_abstract.

[34] **Joshua T Vogelstein** and Carey E Priebe. "Nonparametric Two-Sample Testing on Graph-Valued Data." In: Duke Workshop on Sensing and Analysis of HighDimensional Data, Durham, NC, USA, July 2013.

[33] Yichen Qin, Disa Mhembere, Sephira Ryman, Rex Jung, **R. Jacob Vogelstein**, Randal Burns, Joshua Vogelstein, and Carey Priebe. "Robust Clustering of Adjacency Spectral Embeddings of Brain Graph Data via Lq-Likelihood". In: OHBM, Seattle, WA, USA, June 2013. URL: http://dx.doi.org/10.6084/m9.figshare.1284153.

[32] Daniel L Sussman, Disa Mhembere, Sephira Ryman, Rex Jung, R. Jacob Vogelstein, Randal Burns, Joshua T Vogelstein, and Carey E Priebe. "Massive Diffusion MRI Graph Structure Preserves Spatial Information". In: OHBM, Seattle, WA, USA, June 2013. URL: http://dx.doi.org/10.6084/m9.figshare.1284155.

[31] Disa Mhembere, **Randal Burns**, Joshua T. Vogelstein, R. Jacob Vogelstein, Daniel Sussman, Carey Preibe, Rex Jung, and Sephira Ryman. "Multivariate Invariants from Massive Brain-Graphs". In: OHBM, Seattle, WA, USA, June 2013. URL: http://dx.doi.org/10.6084/m9.figshare.1284154.

[30] William Gray Roncal, Dean M. Kleissas, James M. Burck, Priya Manavalan, **Joshua T. Vogelstein**, Eric Perlman, Randal Burns, and R. Jacob Vogelstein. "Towards a Fully Automatic Pipeline for Connectome Estimation from High-Resolution EM Data". In: OHBM, Seattle, WA, USA, June 2013. URL: http://dx.doi.org/10.6084/m9.figshare.1284151.

[29] Danai Koutra, Yu Gong, Sephira Ryman, Rex Jung, **Joshua T. Vogelstein**, and Christos Faloutsos. "Are All Brains Wired Equally?" In: vol. 1. 4.2. Proceedings of the 19th Annual Meeting of the Organization for Human Brain Mapping (OHBM), Seattle, WA, USA, June 2013, p. 3. URL: http://dx.doi.org/10.6084/m9.figshare.1284149.

[28] N. Sismanis, D. L. Sussman, **J. T. Vogelstein**, W. Gray, R. J. Vogelstein, E. Perlman, D. Mhembere, S. Ryman, R. Jung, R. Burns, C. E. Priebe, N. Pitsianis, and X. Sun. "Feature Clustering from a Brain Graph for Voxel-to-Region Classification". In: 5th Panhellic Conference on Biomedical Technology, Athens, Greece, Apr. 2013. URL: http://dx.doi.org/10.6084/m9.figshare.1284143.

[27] Airan Raag D, **Joshua Vogelstein**, Brian Caffo, James J Pekar, and Sair Haris I. "Reproducible differentiation of individual of individual subjects with minimal acquisition time via resting state fMRI". In: Proc ISMRM, Salt Lake City, UT, USA, Apr. 2013, p. 1932. URL: http://dx.doi.org/10.6084/m9.figshare.1284146.

[26] Eftychios A. Pnevmatikakis, Tim Machado, Logan Grosenick, Ben Poole, **Joshua T. Vogelstein**, and Paninsk Liam. "Rank-penalized nonnegative spatiotemporal deconvolution and demixing of calcium inaging data". In: COSYNE, Salt Lake City, UT, USA, Mar. 2013. URL: http://dx.doi.org/10.6084/m9.figshare.1284170.

[25] **Joshua T Vogelstein** et al. "Anomaly Screening and Clustering of Multi-OBject Movies via Multiscale Structure Learning". In: DARPA XDATA Colloquium, 2013.

[24] **J. Vogelstein**, S. Sikka, B. Cheung, R. Khanuja, Q. Li, .G. Yan C, C. Priebe, V. Calhoun, R. J. Vogelstein, M. Milham, and R. Burns. "BRAINSTORM towards clinically and scientifically useful neuroimaging analytics". In: Neuroinformatics, Munich, Germany, Sept. 2012. URL: http://dx.doi.org/10.6084/m9.figshare.1284173.

[23] **Joshua T. Vogelstein**, Davi Bock, William Gray, Daniel Sussman, Randal Burns, Dean Kleissas, David Marchette, Donniell E. Fishkind, Minh Tang, Greg Hager, R. Jacob Vogelstein, and Priebe Carey E. "Statistical Connectomics". In: Janelia Farm conference, Statistical Inference and Neuroscience, Loudoun County, VA, USA, May 2012. URL: http://dx.doi.org/10.6084/m9.figshare.1284174.

[22] William R. Gray, Dean M. Kleissas, James M. Burck, **Joshua T. Vogelstein**, Eric Perlman, Philippe M. Burlina, Randal Burns, and Vogelstein R. Jacob. "Towards a Fully Automatic Pipeline for Connectome Estimation from High-Resolution EM Data". In: Cold Spring Harbor Laboratory, Neuronal Circuits, Cold Spring Harbor, NY, USA, 2012. URL: http://dx.doi.org/10.6084/m9.figshare.1284176.

[21] **J T Vogelstein**, D E Fishkind, D L Sussman, and C E Priebe. "Large graph classification: theory and statistical connectomics applications". In: IMA conference on Large Graphs, University of Minnesota, Minneapolis, MN, USA, Oct. 2011. URL: http://dx.doi.org/10.6084/m9.figshare.1284184.

[20] **Joshua T Vogelstein**, D L Sussman, M Tang, D E Fishkind, and Carey E Priebe. "Dot product embedding in large (errorfully observed) graphs with applications in statistical connectomics". In: IMA conference on Large Graphs, University of Minnesota, Minneapolis, MN, USA, Oct. 2011.

[19] **Joshua T Vogelstein**, W Gray, J G Martin, G C Coppersmith, M Dredze, J Bogovic, J L Prince, S M Resnick, Carey E Priebe, and R J Vogelstein. "Connectome Classification using statistical graph theory and machine learning". In: Society for Neuroscience, Washington DC, USA, Oct. 2011. URL: http://dx.doi.org/10.6084/m9.figshare.1284178.

[18] William R Gray, J A Bogovic, **Joshua T Vogelstein**, C Ye, B A Landman, J L Prince, and R Jacob Vogelstein. "Magnetic resonance connectome automated pipeline and repeatability analysis". In: Society for Neuroscience, Washington DC, USA, Oct. 2011. URL: http://dx.doi.org/10.6084/m9.figshare.1284177.

[17] **Joshua T Vogelstein**, E Perlman, D Bock, W C Lee, M Chang, B Kasthuri, M Kazhdan, C Reid, J Lichtman, R Burns, and R Jacob Vogelstein. "Open Connectome Project: collectively reverse engineering the brain one synapse at a time". In: *Neuroinformatics, Boston, MA, USA* (Sept. 2011). URL: http://dx.doi.org/10.6084/m9.figshare.1284181.

[16] **Joshua T Vogelstein**, William R Gray, R Jacob Vogelstein, J Bogovic, S Resnick, J Prince, and Carey E Priebe. "Connectome Classification: Statistical Graph Theoretic Methods for Analysis of MR-Connectome Data". In: Organization for Human Brain Mapping, Quebec City, Canada, June 2011. URL: http://dx.doi.org/10.6084/m9.figshare.1284179.

[15] **Joshua T Vogelstein**, Carey E Priebe, R Burns, R Jacob Vogelstein, and J Lichtman. "Measuring and reconstructing the brain at the synaptic scale: towards a biofidelic human brain in silico". In: DARPA Neural Engineeering, Science and Technology Forum, San Diego, CA, USA, Nov. 2010. URL: http://dx.doi.org/10.6084/m9.figshare.1285813.

[14] William R Gray, **Joshua T Vogelstein**, J Bogovic, A Carass, J L Prince, B Landman, D Pham, L Ferrucci, S M Resnick, Carey E Priebe, and R Jacob Vogelstein. "Graph-Theoretical Methods for Statistical Inference on MR Connectome Data". In: DARPA Neural Engineering, Science and Technology Forum, San Diego, CA, USA, Nov. 2010. URL: http://dx.doi.org/10.6084/m9.figshare.1285815.

[13] **Joshua T Vogelstein**, J Bogovic, A Carass, WR Gray, JL Prince, B Landman, D Pham, L Ferrucci, SM Resnick, Carey E Priebe, and RJ Vogelstein. "Graph-Theoretical Methods for Statistical Inference on MR Connectome Data". In: Organization for Human Brain Mapping, Barcelona, Spain, June 2010. URL: http://dx.doi.org/10.6084/m9.figshare.1285813.

[12] **Joshua T Vogelstein**, RJ Vogelstein, and Carey E Priebe. "A Neurocognitive Graph-Theoretical Approach to Understanding the Relationship Between Minds and Brains". In: CSHL conference on Neural Circuits, Cold Shore Harbor, NY, USA, Mar. 2010. URL: http://dx.doi.org/10.6084/m9.figshare.1284694.

[11] **Joshua T Vogelstein**, Y Mishchenki, AM Packer, TA Machado, R Yuste, and L Paninski. "Towards Confirming Neural Circuit Inference from Population Calcium Imaging". In: COSYNE, Salt Lake City, UT, USA, Feb. 2010. URL: http://dx.doi.org/10.6084/m9.figshare.1284693.

[10] **Joshua T Vogelstein**, Y Mishchenki, AM Packer, TA Machado, R Yuste, and L Paninski. "Towards Inferring Neural Circuit Inference from Population Calcium Imaging". In: COSYNE, Salt Lake City, UT, USA, Feb. 2010. URL: http://dx.doi.org/10.6084/m9.figshare.1285819.

[9] **Joshua T Vogelstein**, Y Mishchchenko, A M Packer, T A Machado, R Yuste, and L Paninski. "Towards Confirming Neural Circuits from Population Calcium Imaging". In: NIPS Workshop on Connectivity Inference in Neuroimaging, Whistler, BC, Canada, Dec. 2009. URL: http://dx.doi.org/10.6084/m9.figshare.1285822.

[8] **Joshua T Vogelstein**, Y Mishchenki, AM Packer, TA Machado, R Yuste, and L Paninski. "Towards Inferring Neural Circuit Inference from Population Calcium Imaging". In: COSYNE, Salt Lake City, UT, USA, Feb. 2009. URL: http://dx.doi.org/10.6084/m9.figshare.1285821.

[7] **Joshua T Vogelstein**, B Babadi, BO Watson, R Yuste, and L Paninski. "From Calcium Sensitive Fluorescence Movies to Spike Trains". In: Society for Neuroscience, Washington DC, USA, Nov. 2008. URL: http://dx.doi.org/10.6084/m9.figshare.1285824.

[6] **Joshua T Vogelstein**, B Babadi, and L Paninski. "Model-Based Optimal Inference of Spike-Times and Calcium Dynamics given Noisy and Intermittent Calcium-Fluorescence Imaging". In: COSYNE, Salt Lake City, UT, USA, Feb. 2008. URL: http://dx.doi.org/10.6084/m9.figshare.1285826.

[5] **Joshua T Vogelstein** and L Paninski. "Inferring Spike Trains, Learning Tuning Curves, and Estimating Connectivity from Calcium Imaging". In: Integrative Approaches to Brain Complexity, 2008. URL: http://dx.doi.org/10.6084/m9.figshare.1285827.

[4] **Joshua T Vogelstein**, B Jedynak, K Zhang, and L Paninski. "Inferring Spike Trains, Neural Filters, and Network Circuits from in vivo Calcium Imaging". In: Society for Neuroscience, San Diego, CA, USA, Nov. 2007. URL: http://dx.doi.org/10.6084/m9.figshare.1285846.

[3] **Joshua T Vogelstein**, K Zhang, B Jedynak, and L Paninski. "Maximum Likelihood Inference of Neural Dynamics under Noisy and Intermittent Observations using Sequential Monnte Carlo EM Algorithms". In: COSYNE, Salt Lake City, UT, USA, Feb. 2007. URL: http://dx.doi.org/10.6084/m9.figshare.1285828.

[2] **Joshua T Vogelstein** and K Zhang. "A novel theory for simultaneous representation of multiple dynamic states in hippocampus". In: Society for Neuroscience, San Diego, CA, USA, 2004.

[1] **Joshua T Vogelstein**, LH Snyder, M Warchol, and DE Angelaki. "Up-down asymmetry in memory guided saccadic eye movements are independent of head orientation in space". In: Society for Neuroscience, Orlando, FL, USA, 2002.

Teaching Experience - Ongoing Courses

Fall '20 **Course Director, JHU**, *EN.580.237/437/637*, NeuroData Design I, enrollment ??.
Spring '20 **Course Director, JHU**, *EN.580.438/638*, NeuroData Design II, enrollment 32.
Fall '19 **Course Director, JHU**, *EN.580.237/437/637*, NeuroData Design I, enrollment 46.
Spring '19 **Course Director, JHU**, *EN.580.438/638*, NeuroData Design II, enrollment 18.
Fall '18 **Course Director, JHU**, *EN.580.237/437/637*, NeuroData Design I, enrollment 22.
Spring '17 **Course Director, JHU**, *EN.580.238/438/638*, NeuroData Design II, enrollment 14.
Winter '17 **Course Director, JHU**, *EN.580.574*, BME Research Intersession, enrollment 6.
Fall '17 **Course Director, JHU**, *EN.580.247/437/637*, NeuroData Design I, enrollment 15.
Spring '16 **Course Director, JHU**, *EN.580.468*, The Art of Data Science, enrollment 24.
Fall '16 **Course Director, JHU**, *EN.580.437*, NeuroData Design I, enrollment 16.
Spring '15 **Course Director, JHU**, *EN.580.694*, Statistical Connectomics, enrollment 26.

Teaching Experience - One-Time

Spring '19 **Guest Lecturer, JHU**, *EN.580.422*, Systems Bioengineering II.
2 Lectures

Spring '19 **Guest Lecturer, JHU**, *AS.080.321*, Computational Neuroscience.
2 Lectures

Spring '18 **Guest Lecturer, JHU**, *EN.580.422*, Systems Bioengineering II.
2 Lectures

Spring '18 **Guest Lecturer, JHU**, *AS.080.321*, Computational Neuroscience.
2 Lectures

Spring '17 **Guest Lecturer, JHU**, *EN.580.422*, Systems Bioengineering II.
2 Lectures

Spring '16 **Guest Lecturer, JHU**, *EN.580.422*, Systems Bioengineering II.
2 Lectures

Winter '16 **Guest Lecturer, JHU**, *EN.600.221*, Introduction to Connectomics.
1 Lecture

Fall '16 **Guest Lecturer, JHU**, *EN.580.111*, BME Modeling and Design.
1 Lecture

Fall '15 **Course Co-Director, JHU**, *Introduction to Computational Medicine*.

Educational Workshops

Summer '19 **DiPy Workshop**, Bloomington, Indiana, 1 day lecture on statistical connectomics.

Fall '18 **Society for Neuroscience Annual Meeting**, *Educational Workshop*, San Diego, CA, 1 day lecture on statistical connectomics.

Fall '17 **Society for Neuroscience Annual Meeting**, *Educational Workshop*, San Diego, CA, 1 day lecture on statistical connectomics.

Summer '16 **CRCNS Course on Mining and Modeling of Neuroscience Data**, *Redwood Center for Theoretical Neuroscience*, University of California, Berkeley, 2 day lecture on statistical connectomics.

Advisory Information

Postdoctoral Fellows

08/19 – **Javier How, PhD**, *Postdoctoral Fellow*, Kavili NDI, JHU.
Working on understanding how larval zebrafish generalize information from one task to perform another task, taking advantage of their optical transparency to record neuron activation.

07/19 – **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 – **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.

08/18 – 08/20 **Jesús Arroyo, PhD**, *Post-doctoral Fellow*, CIS, JHU.
Working on graph matching and joint graph embedding.

07/18 – 07/20 **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

07/19 – **Jayanta Dey, MSE**, *PhD advisee*, BME, JHU.
Currently working on lifelong learning that aims at training a machine learning model on multiple tasks and transferring knowledge among tasks.

05/20 – **Tingshan Liu, BA**, *PhD advisee*, BME, JHU.
Currently focusing on implementation of hierarchical clustering and stochastic block modeling algorithms in Python based on gaussina mixture modeling.

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

08/19 – **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.

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

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

08/16 – **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.

Visiting Doctoral Student

03/19 – 09/19 **Derek Pisner**, *PhD advisee*, JHU/UT Austin.

M.S. Students

09/20 – **Kaleab Alemayehu**, *MS advisee*, BME, JHU.
Working on ProgLearn to enable backward and forward knowledge transfer to improve performance on both past and future tasks using decision forests and deep networks

08/20 – **Jong Shin**, *MS advisee*, BME, JHU.

05/20 – **Ali Saad-Eldin**, *MS advisee*, BME, JHU.
Working on implementing and improving combinatorial optimization algorithms, specifically the Quadratic Assignment Problem

02/20 – **Will LeVine**, *MS advisee*, BME, JHU.
Exploring different sub-algorithms within progressive learning to alleviate harmful effects that result from training on unhelpful data

09/19 – **Ross Lawrence**, *MS advisee*, BME, JHU.
Lead m2g developer, maintainer of neuroparc, MRI analysis lead

06/19 – 12/20 **Bijan Varjavand**, *MS advisee*, BME, JHU.
Submitted manuscript to PAMI on advancing statistics on populations of networks.

10/18 – **Alex Loftus**, *MS advisee*, BME, JHU.
Developer of m2g, helping transition from a stand-alone package to be integrated with DiPy

06/18 – 06/19 **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 advisee*, BME, JHU.
Lead deveoper of m2g, 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 noted otherwise)

09/20 – **Rebecca Yin**, *BSE*, BME, JHU.
Currently working on using Uncertainty Forests to generate independence tests directly

08/20 – **Alisha Kodibagkar**, *BSE*, BME, JHU.
Assisting in the integration of brainlit packages with Azure services

08/20 – **Shreya Singh**, *BSE*, BME, JHU.
Evaluating different methods of foreground/background classification on images of fluroescently labeled projection neurons

06/19 – **Vivek Gopalakrishnan**, *BSE*, BME, JHU.
Winner of Pistritto Fellowship, worked on statistics of populations of connectomes in Austim mouse models and human data.

06/19 – 12/19 **Richard Guo**, *BSE*, BME, JHU.
Developed uncertainty forests, an approach for estimated posterior class probabilities, conditional entropy, and mutual information for high-dimensional data common in brain science applications.

08/15 – 08/16 **Albert Lee,BSE**, BME, JHU.
Developed big data visualization tools.

06/15 – 12/15 **Ron Boger, BSE**, BME, JHU.
Worked at a computational medicine start-up in Silicon Valley, worked on high-dimensional low-sample size theory.

05/15 – 05/16 **Jordan Matelsky, BSE**, CS and Neuroscience, JHU.
Currently a data scientist at APL, developed a number of simple WebApps in support of big data management.

02/15 – 05/16 **Ivan Kuznetsov, BSE**, BME, JHU.
Currently an MD/PhD Candidate at the UPenn, winner of Soros Fellowship, worked on analysis of data from Dr. Daniel Amen, developed matrix exploratory data analysis package.

Research Track Faculty Mentorship

02/19 – 12/19 **Hayden Helm, MSE**, *Assistant Research Faculty*, BME, JHU.
Lead research efforts developing theory and methods for lifelong learning

08/16 – 08/18 **Eric Perlman, PhD**, *Assistant Research Scientist*, BME, JHU.
Lead Scientist in developing storage, transfer, and visualization solutions for large data in our cloud infrastructure

03/16 – 06/20 **Jesse Patsolic, MA**, *Assistant Research Faculty*, BME, JHU.
Lead developer converting our extensions to decision forests to be merged into sklearn

Staff Research Scientists

03/20 – **Ali Geisa, MS**, *Research Assistant*, Research Assistant, BME.
JHU

07/19 – 08/20 **Ronak Mehta, MSE**, *Research Assistant*, BME, JHU.
Researching progressive and lifelong learning theory
Finalizing three manuscripts on (1) uncertainty forests, (2) t
(3) lifelong learning forests

06/19 – **Ronan Perry**, *Research Assistant*, BME, JHU.
Developed generalized canonical correlation analysis code for analysis of high-dimensional brain imaging data in a novel meditation dataset.

06/19 – 08/20 **Devin Crowley**, *Research Assistant*, BME, JHU.
Lead developer of our scalable Python implementation of LDDMM

06/18 – 12/19 **Benjamin Falk, PhD**, *Research Engineer*, BME, JHU.
Lead software engineer, oversees all development projects, solely responsible for all cloud infrastructure

High School Students

Summer '19 **Kareef Ullah**, *Summer Intern*, BME, JHU.
Will begin undergrad in BME at JHU in Fall 2020

Summer '19 **Shunan Wu**, *Summer Intern*, BME, JHU.
Applied to BME PhD Program in Fall 2020

Summer '19 **Shiyu Sun**, *Summer Intern*, BME, JHU.
Applied to BME PhD Program in Fall 2020

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.
Applied to PhD Program in Fall 2019

Thesis Committee Service (BME unless noted otherwise)

2019 **Browne, James**, *Computer Science*, JHU Ph.D. Student, Graduated 2019.

2019 **Mhembere, Disa**, *Computer Science*, JHU Ph.D. Student, Graduated 2019.

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

2018 **Wang, Shangsi**, *Applied Mathematics and Statistics*, JHU Ph.D. Student, Graduated 2018.

2018 **Tang, Runze**, *Applied Mathematics and Statistics*, JHU Ph.D. Student, Graduated 2018.

2018 **Lee, Youjin**, *Biostatistics*, JHU Ph.D. Student, Graduated 2018.

2017 **Zheng, D**, *Computer Science*, JHU Ph.D. Student, Graduated 2017.

2017 **Binkiewicz, Norbert**, *Statistics*, University of Wisconsin Ph.D. Student, Graduated 2017.

2016 **Gray-Roncal, Will**, *Computer Science*, JHU Ph.D. Student, Graduated 2016.

Research

The table below shows my direct (total) cost expenditures since being hired, indicating a steady increase >30% per year.

Financial Year	Direct	Total
2015:	$113,761	$168,924
2016:	$360,123	$524,225
2017:	$459,523	$709,019
2018:	$550,011	$887,186
2019:	$850,836	$1,366,308

External Research Support: Current

2020 - 2025 **NSF**, *AI Institute: Planning: BI4ALL: Understanding Biological*, NSF 20-503,
PI: Kording, K.
Role on Project: Co-Investigator
Term: 01-Oct-2020 to 31-Jul-2022
Funding to lab, current year: $79,629
The goal of this project is to plan an AI institution via several meetings and workshops.

2020-2025 **National Science Foundation**, *Collaborative Research: Transferable, Hierarchical, Expensive, Optimal, Robust, Interpretable Networks*, NSF 20-540,
PI: Vidal, R.
Role on Project: Co-Investigator
Term: 01-Sep-2020 to 31-Aug-2025
Funding to lab, entire period: $1,650,000 (direct)
Funding to lab, current year: $660,000 (direct)
The goal of this project is to develop a mathematical, statistical and computational framework that helps explain the success of current network arcitectures, understand its pitfalls, and guide the design of novel architectures with guaranteed confidence, robustness, interpretability, optimality, and transferability..

2020 - 2025 **National Science Foundation**, *NeuroNex2: Enabling Identification and Impact of Synaptic Weight in Functional Networks*, NSF 2014862,
PI: Harris, K.
Role on Project: Co-Investigator
Term: 01-Apr-2020 to 31-Mar-2025
Funding to lab, entire period: $609,294 (direct) $997,719 (total)
Funding to lab, current year: $121,587 (direct) $199,543 (total)
The goal is to develop the requisite technology to understand the impact of synaptic weight on functional networks.

2020 - 2023 **National Institutes of Health**, *Graspy: A python package for rigorous statistical analysis of populations of attributed connectomes*, NIH MH-19-147,
PI: Vogelstein, J.
Term: 01-Jul-2020 to 30-Jun-2023
Funding to the lab, entire period: $861,240 (direct) $1,416,279 (total)
Funding to the lab, current year: $283,301 (direct) $471,082 (total)
The goal of this project is to establish a state-of-the-art toolbox for analysis of connectomes, spanning taxa, scale, and complexity. we will develop and extend implementations to enable neurobiologists to (1) estimate latent structure from attributed connectomes, (2) identify meaningful clusters among populations of connectomes, and (3) detect relationships between connectomes and multivariate phenotypes..

2020 – 2025 **National Science Foundation**, *CAREER: Foundational Statistical Theory and Methods for Analysis of Populations of Attributed*, NSF 17-537,
PI: Vogelstein, J.
Term: 01-Jan-2020 to 31-Dec-2025
Funding to lab, entire period: $630,230 (total) $384,873 (direct)
Funding to lab, current year: $126,046 (total) $76,975 (direct)
The goal is to establish foundational theory and methods for analyzing populations of attributed connectomes.

2019 - 2023 **National Institutes of Health**, *Brain Networks in Mouse Models of Aging*, NIH RO1AG066184-01,
PI: Badea, A.
Role on Project: Co-Investigator
Term: 01-Dec-2019 to 30-Nov-2023
Funding to lab, current year: $205,998
The goal of this grant is to generate connectomes and RNA-seq transcriptomes to characterize and differentiate APOE mice as a model of aging. .

2019 – 2022 **National Institutes of Health**, *Accessible technologies for high-throughput, whole-brain reconstructions of molecularly characterized mammalian neurons*, NIH RFA-MH-19-148,
PI: Muller, M.
Role on Project: Co-Investigator
Term: 01-Sept-2019 to 31-Aug-2022
Funding to lab, entire period: $1,180,445 (total) $753,974 (direct)
Funding to lab, current year: $383,482 (total) $251,325 (direct)
The overall goal of the proposal is to develop technologies for the brain wide reconstruction of axonal arbors of molecularly defined neurons. The proposal aims at overcoming barriers in neuronal labeling, imaging and computation to achieve this goal, and to develop a technology platform that can be scaled to all neurons of the brain.

2019 – 2020 **National Institutes of Health**, *Reproducible imaging-based brain growth charts for psychiatry*, NIH R01MH120482-01,
PI: Satterthwaite, T.
Role on project: Co-Investigator
Term: 01-Aug-2019 to 31-May-2020
Funding to lab, entire period: $362,861 (total) $231,276 (direct)
Aggregate, harmonize, and analyze existing large-scale pediatric neuroimaging datasets to identify normative and clinical brain growth curves.

2019 – **Microsoft**, *Microsoft Research Award*,
PI: Vogelstein, J.
Term: Unrestricted Gift
Funding to lab, entire period: $50,000 (total)
Research and development of neuroscience and connectomes around neuronal circuit and system modeling, application of time-series-of-graphs and dynamics to neuronal signaling analysis and connectomes, and in the abstractions of matter, math, machines that point toward complex systems composed of low-level components.

2018 – 2021 **National Science Foundation**, *SemiSynBio: Collaborative Research: YeastOns: Neural Networks Implemented in Communication Yeast Cells*, NSF 1807369,
PI: Schulman, E.
Role on project: Co-Investigator
Term: 16-Jul-2018 to 30-Jun-2021
Funding to lab, entire period: $263,942 (total) $172,971 (direct)
Funding to lab, current year: $87,980 (total) $57,657 (direct)
Provide neuroscience and machine learning expertise to guide the design of the computational learning capabilities of the system.

2017 – 2021 **DARPA**, *Lifelong Learning Forests*, FA8650-18-2-7834,
PI: Vogelstein, J.
Term: 01-Nov-2017 to 31-Oct-2021
Funding to lab, entire period: $1,839,308 (total) $1,123,474 (direct)
Funding to lab, current year: $199,179 (total) $121,667 (direct)
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.

2017 – 2021 **DARPA**, *Continual Learning Across Synapses, Circuits, and Brain Areas*, FA8650-18-2-7834,
PI: Tolias, A.
Role on project: Co-Investigator
Term: 01-Nov-2017 to 30-Oct-2021
Funding to lab, entire period: $796,715 (total) $486,666 (direct)
Funding to lab, current year: $199,179 (total) $121,667 (direct)
Develop the pre-processing analysis pipeline for the imaging data collected in this project.

2017 – 2020 **National Science Foundation**, *NeuroNex Innovation Award: Towards Automatic Analysis of Multi-Terabyte Cleared Brains*, NSF 1707298,
PI: Vogelstein, J.
Term: 01-Sept-2017 to 31-Aug-2020 (No Cost Extension)
Funding to lab, entire period: $959,999 (total) $588,758 (direct)
Funding to lab, current year: $320,000 (total) $196,252 (direct)
We propose to lower the barrier to connecting data to analyses and models by providing a coherent cloud computational ecosystem that minimizes current bottlenecks in the scientific process.

2017 – 2022 **National Institutes of Health**, *Sensorimotor processing, decision making, and internal states: towards a realistic multiscale circuit model of the larval zebrafish brain*, NIH 1U19NS104653-01,
PI: Engert, F.
Role on Project: Co-Investigator
Term: 01-Sept-2017 to 31-Aug-2022
Funding to lab, entire period: $1,050,000 (total) $655,206 (direct) (JHU sub-award)
Funding to lab, current year: $210,000 (total) $131,041 (direct)
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.

External Research Support: Completed

2018 – 2020 **Schmidt Science Foundation**, *Connectome Coding at the Synaptic Scale*, Nascent Innovation Grant 128503,
PI: Vogelstein, J.
Term: 01-Jan-2018 to 31-Dec-2020
Funding to lab, entire period: $250,000 (total)
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.

2017 – 2020 **National Institutes of Health**, *CRCNS US-German Res Prop: functional computational anatomy of the auditory cortex*, NIH 1R01DC016784-01,
PI: Ratnanather, J.
Role on Project: Co-Investigator
Term: 01-July-2017 to 30-June-2020
Funding to lab, entire period: $747,143 (total) $458,519 (direct)
Create a robust computational framework for analyzing the cortical ribbon in a specific region: the auditory cortex.

2017 – 2020 **National Science Foundation**, *Multiscale Generalized Correlation: A Unified Distance-Based Correlation Measure for Dependence Discovery*, NSF 1921310,
PI: Cencheng, S.
Role on project: Co-Investigator
Term: 01-May-2017 to 30-April-2020
Funding to lab, entire period: $200,000 (total) $124,189 (direct)
Establish a unified methodology framework for statistical testing in high-dimensional, noisy, big data, through theoretical advancements, comprehensive simulations, and real data experiments.

2016 – 2020 **DARPA**, *D3M: What Would Tukey Do?*, FA8750-17-2-0112,
PI: Priebe, C.
Role on project: Co-Investigator
Term: 01-Oct-2016 to 30-Sep-2020
Funding to lab, entire period: $4,406,360 (total) $2,746,050 (direct)
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.

2017-2019 **National Science Foundation**, *NeuroNex Technology Hub: Towards the International Brain Station for Accelerating and Democratizing Neuroscience Data Analysis and Modeling*, NSF 16-569,
PI: Vogelstein, J.
Funding to lab, entire period: $246,773
We propose to lower the barrier to connecting data to analyses and models by providing a coherent cloud computational ecosystem that minimizes current bottlenecks in the scientific process.

2017 – 2018 **DARPA**, *The Brain Ark*, 90076467,
PI: Vogelstein, J.
Funding to lab, entire period: $92,376 (total) $56,499.08 (direct)
Characterize the statistical properties of the individual graphs, to identify circuit motifs, both that specialize in a species specific fashion, and that are preserved across species. As a test, will compare the connectomes of sea lions and coyotes.

2017 – 2018 **The Kavli Foundation**, *The International Brain Station*, 90071826,
PI: Vogelstein, J.
Funding to lab, entire period: $50,000 (total) $50,000 (direct)
Take the first few steps towards building the international brain station.

2017 – 2018 **National Science Foundation**, *Brain Comp Infra: EAGER: BrainLab CI: Collaborative, Community Experiments*, ACI-1649880,
PI: Miller, B.
Role of Project: Co-Investigator
Funding to lab, entire period: $294,599 (total) $180,736 (direct)
The BrainLab CI prototype system will deploy an experimental-management infrastructure that allows users to construct community-wide experiments that implement data and metadata controls on the inclusion and exclusion of data.

2016 – 2019 **National Science Foundation**, *A Scientific Planning Workshop for Coordinating Brain Research Around the Globe*, NSF 1637376 Part 1 of 2,
PI: Vogelstein, J.
Funding to lab, entire period: $97,950 (total) $97,950 (direct)
This travel grant is for the expressed purposes of gathering researchers from around the globe to discuss the new way to further brain research during part one of a two day conference.

2016 – 2019 **National Science Foundation**, *A Scientific Planning Workshop for Coordinating Brain Research Around the Globe*, NSF 1637376 Part 2 of 2,
PI: Vogelstein, J.
Funding to lab, entire period: $16,327 (total) $14,491 (direct)
This travel grant is for the expressed purposes of gathering researchers from around the globe to further discuss advancements in brain research during the second part of a two day conference.

2015 – 2018 **DARPA**, *From RAGs to Riches: Utilizing Richly Attributed Graphs to Reason from*, N66001-15-C-40401,
PI: Vogelstein, J.
Funding to lab, entire period: $2,103,091.60 (total) $1,298,204 (direct)
Multiple, large, multifarious brain imaging datasets are rapidly becoming standards in neuroscience. Yet, we lack the tools to analyze individual datasets, much less populations thereof. Therefore, we will develop theory and methods to analyze and otherwise make such data available.

2014 – 2016 **DARPA**, *Scalable Grain Graph Analyses Using Big-Memory, High-IPS Compute Architectures*, N66001-14-1-4028,
PI: Burns, R.
Role on Project: Co-Investigator
Funding to lab, entire period: $39,882 (total) $28,272 (direct)
Build software infrastructure to enable analytics on billion node, terabyte sized networks using commodity hardware.

2014 – 2019 **National Institutes of Health**, *Synaptomes of Mouse and Man*, NIH R01NS092474,
PI: Smith, S.
Role on project: Co-Investigator
Funding to lab, entire period: $756,417 (total) $491,341 (direct)
The major goals of this project are to discover the synaptic diversity and complexity in mammalian brains, specifically comparing and contrasting humans with mice, the leading experimental animal.

2012 – 2015 **National Institute of Biomedical Imaging and Bioengineergng**, *CRCNS: Data Sharing: The EM open Connectome Project*, RO1EB16411,
PI: Burns, R.
Role of Project: Co-Investigator
Funding to lab, entire period: $70,823 (total) $46,517 (direct)
Develop cyberinfrastructure to support management, visualization, storage, and analysis of large-scale electron microscopy data.

Service

Department Service

Summer '20 **Co-Chair**, *SciPy mini-symposium: Biology and Bioinformatics*.

Winter '19 **Track Organizer**, *AI in Healthcare: From Bench to Bedside*, Organizer for Breakout Topic Sessions on artificial intelligence.

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 ($\sim$ 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 ($\sim$ 50 participants).

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

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

Summer '17 **Organizer**, *NeuroStorm*, https://brainx2.io, Workshop to 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 ($\sim$ 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.

2016 **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 ($\sim$ 75 participants).

2015 – 2017 **Co-Founder and Faculty Advisor**, *MedHacks*, Medhacks is one of the first and largest hackathons dedicated specifically to hacking on medical advances, started entirely by BME undergrads at JHU.

Professional Service

2019 – **Mentor**, *Black in AI*.

2017 – **Scientific Advisory Board**, *NSF NeuroNex*, Enhanced resolution for 3DEM analysis of synapses across brain regions and taxa. Provided scientific, computational, and statistical guidance to a flagship NSF funded BRAIN Initiative program.

2017 – **Chair of Committee of Data Cores**, *U19 Data Cores*, The U19 program is NIH's flagship BRAIN Initative program, with five original awardees, each with a dedicated Data Core and designated PI. I was elected the chair of the committee of Data Core PIs.

2017 **Consultant for Nature Publishing Group**, The journal Nature, flagship journal of Nature Publishing Group, decided to create a "Code and Software Submission Checklist". They consulted me on their first draft, and I helped re-write it. An image of the final checklist is available here.

2016 **Co-Organizer**, *Brains and Bits: Neuroscience Meets Machine Learning, NIPS Workshop*, http://www.stat.ucla.edu/~akfletcher/brainsbits_overview.html.

2015 **Co-Organizer**, *BigNeuro2015: Making Sense of Big Neural Data, NIPS Workshop*, http://neurodata.io/bigneuro2015.

2012 **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).

2011 – **Open Connectome Project**, The co-founder of the "Open Connectome Project" (OCP), for several years, I was the only neuroscientist that could easily store, manage, and analyze very big datasets, spanning first tens of terabytes, and then hundreds. For that reason, I was an essential co-author on a number of big data papers. Specifically, though I sometimes contributed relatively little to the scientific ideas, I often was required to complete, visualize, and/or share the data. Perhaps more importantly, both funding agencies and journals began mandating that these large datasets be publicly shared, and OCP was literally the only option. This is despite often not having funding, nor being a co-author, on the manuscripts.

2010 – **AWS Open Neuro Data Registry**, Our lab co-founded the Registry of Open Data on Amazon Web Serivces (AWS). The implication of this is that now, pending a few minor considerations, any neuroscientist that collects large image data can deposit it online *for free*. This means that neither they nor we must request funding to store the data. Our lab maintains this repository, but only by virtue of ensuring instructions for uploading, visualizing, and downloading are up to date, and acting as a gatekeeper to ensure only appropriate data are deposited there.

Journal Service

Editorial Board

2019 – **Associate Editor**, *Journal of the American Statistical Association*.

2018 – **Editor**, *Neurons, Behavior, Data analysis, and Theory*.

2016 **Guest Associate Editor**, *PLoS Computational Biology*.

Conference and Journal Reviewer

Annals of Applied Statistics (AOAS).

Bioinformatics.

International Conference on Learning Representations (ICLR).

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

Other Scholarly and Technical Output

Boards

2018 – **Advisory Board**, *Mind-X*, A neurotechnology company combining brain-computer interfaces and artificial intelligence to make the world's information available with the speed and ease of a single thought., Incubated at Camden Partners Nexus, completed an initial round of funding for an undisclosed amount.
15 employees.

2017 – **Advisory Board**, *PivotalPath*, PivotalPath is a leading hedge fund research and intelligence organization built by a team of experienced alternative investment professionals and fintech developers., Raised undisclosed amount of funding.
11 employees.

Consultancy

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

2016 **Consultant**, *Scanadu*.

Other Roles in Companies

2017 – **Co-Founder**, *gigantum*, The future of data science is open, decentralized and user friendly. That is why we created a platform that enables anybody to create and share totally reproducible computational work with the world., Completed initial round of seed funding for undisclosed amount from Digital Science, which also funds figshare, readcube, altmetric, overleaf, and more.
15 employees.

2016 – **Co-Founder**, *d8alab*, Our services include evaluating model performance, building prototype R/Shiny web applications and basic data cleaning., Provides data science consulting for a variety of companies, specifically biomedical data science.
4 employees.

Open-Source Software: Active

Stars denote an individual users appreciation, downloads indicates a user downloading the code, and a fork indicates a user modifying the code.

2020 – **ProgLearn (Progressive Learning)**, A Python package for exploring and using progressive learning algorithms.
22 stars, 29 forks, 37 downloads/month

2019 – **ARDENT (Affine and Regularized Deformative Numeric Transform)**, A Python package for performing automated image registration using LDDMM.
10 stars, 5 forks

2019 – **graspologic (Graph Statistics)**, Co-developed with Microsoft Research: Utilities and algorithms designed for processing and analysis of graphs with specialized graph statistical algorithms.
134 stars, 56 forks, 2,516 downloads/month

2019 – **reg (Image registration)**, A Python package which performs non-linear affine and deformable image registration.
6 stars, 4 forks, 61 downloads/month

2019 – **neuroparc**, This repository contains a number of useful parcellations, templates, masks, and transforms to (and from) MNI152NLin6 space. The files are named according to the BIDs specification.
26 stars, 4 forks

2019 – **Sparse Projection Oblique Randomer Forests (Classification and regression)**, SPORF is an improved random forest algorithm that achieves better accuracy and scaling than previous implementations on a standard suite of > 100 benchmark problems.
54 stars, 35 forks, 73 downloads/month, 36 docker pulls

2019 – **Uncertainty-Forest**, A Python package containing estimation procedures for posterior distributions, conditional entropy, and mutual information between random variables X and Y.
2 stars, 1 fork

2018 – **LOL (Supervised dimensionality reduction)**, Linear Optimal Low-rank (LOL) projection for improved classification performance in high-dimensional classification tasks.
8 stars, 6 forks, 60 downloads/month

2018 – **MGC (Non-parametric hypothesis testing)**, Multiscale Graph Correlation (MGC) is a framework for universally consistent testing high-dimensional and non-Euclidean data.
28 stars, 11 forks, 120 downloads/month, 266 docker pulls

2018 – **m2g (MR graph analysis)**, A Python pipeline which uses diffusion MRI data from individuals to generate connectomes reliably and scalably.
35 stars, 26 forks, 218 downloads/month, 7,900 docker pulls

2018 – **ndcloud (NeuroData Cloud)**, The deployment of tools which support the Open Connectome Project.

2016 – **Non-Parametric-Clustering**, A program which uses non-parametric-clustering to minimize or maximize a given criterion function.
3 stars, 2 forks

Open-source Software: Contributed

2019 **cloud-volume**, Added support for additional file types.

2019 **C-PAC**, Added streamlined reproducible pipeline.

2019 **scipy**, Added mgc, a state of the art method for hypothesis testing we developed in the lab.

2018 – 2019 **neuroglancer**, Added multispectral support to enable light microscopy data use.

2018 **igraph**, Added spectral clustering functionality.

2017 – 2018 **render**, Added cloud support.

2017 **boss**, Developed core functionality.

Open-source Software: Archived

2017 – 2019 **ndex**, Python 3 command-line program to exchange (download/upload) image data with NeuroData's cloud deployment of APL's BOSS spatial database.
3 stars, 0 forks, 89 downloads/month

2017 – 2019 **knor (Clustering)**, Python version of knor, a highly optimized and fast library for computing k-means in parallel with accelerations for Non-Uniform Memory Access (NUMA) architectures.
1 stars, 3 forks, 115 downloads/month

2017 – 2019 **SynapseAnalysis (Synapse Detection)**, A framework to evaluate synaptic antibodies for array tomography applications.
2 stars, 0 forks

2017 – 2018 **MEDA (Matrix Exploratory Data Analysis)**, A python package for matrix exploratory data analysis.
0 stars, 3 forks, 56 downloads/month, 21 docker pulls

2017 – 2018 **ndwebtools**, ndwebtools (ndweb) is a Django application to provide a user-friendly interface for interacting with NeuroData resources and data.
0 stars, 1 forks

2015 – 2018 **ndviz**, Web visualization and analysis tools for neuroimaging datasets, powered by Neuroglancer.
8 stars, 4 forks, 48 docker pulls

2015 – 2016 **DMG**, An implementation of a distributed multigrid Poisson solver for image stitching, smoothing, and sharpenting.
19 stars, 6 forks

2015 **VESICLE (EM Synapse Detection)**, Reference synapse detection program for processing serial electron microscopy data.
3 stars, 3 forks

2015 **CAJAL**, A MATLAB API that provides a simple to use interface with Open Connectome Project servers and provides RAMON Objects, unit tests, configuration scripts, and utilities.
6 stars, 5 forks

2012 – 2017 **FlashGraph (Scalable Analytics)**, General-purpose graph analysis framework that exposes vertex-centric programming interface for users to express varieties of graph algorithms.
220 stars, 42 forks

2012 – 2017 **FlashX (Scalable machine learning)**, A matrix computation engine that provides a small set of generalized matrix operations on sparse matrices and dense matrices to express varieties of data mining and machine learning algorithms.
220 stars, 42 forks

2011 – 2016 **oopsi (Calcium Spike Sorting)**, Model-based spike train inference from calcium imaging.
20 stars, 9 forks

2011 – 2017 **ndstore**, Scalable database cluster for the spatial analysis and annotation of high-throughput brain imaging data.
37 stars, 13 forks

Translation / Technology Transfer Activities

Open Datasets

2019 – **Templier et al. (2019)**, The non-destructive collection of ultrathin sections onto silicon wafers for post-embedding staining and volumetric correlative light and electron microscopy using MagC. MagC allows the correlative visualization of neuroanatomical tracers within their ultrastructural volumetric electron microscopy context.
0 citations, 119 unique visitors

2018 – **Bloss et al. (2018)**, Images of CA1 pyramidal neurons for analysis involving feature-selective firing as a result of dendritic integration of inputs from multiple brain regions. Show that single presynaptic axons form multiple, spatially clustered inputs onto the distal, but not proximal, dendrites of CA1 pyramidal neurons.
20 citations, 530 unique visitors

2018 – **Branch (2018)**, Adult generated neurons in aging M. musculus imaged using array tomography, multi-spectral light microscopy, and electron microscopy.
2 citations, 223 unique visitors

2017 – **Allen Atlas**, Anatomical reference atlases that illustrate the adult mouse brain in coronal and sagittal planes. They are the spatial framework for datasets such as in situ hybridization, cell projection maps, and in vitro cell characterization.atlas.brain-map.org.
142 citations, 1058 unique visitors

2017 – **Hildebrand et al. (2017)**, A multi-resolution serial-section electron microscopy data set containing the anterior quarter of a 5.5 days post fertilization larval zebrafish, including its complete brain acquired by Hildebrand and colleagues. Electron micrographs and reconstructions are available for view in CATMAID.
70 citations, 1,014 unique visitors

2017 – **Tobin et al. (2017)**, Wiring variations that enable and constrain neural computation in a sensory microcircuit.
28 citations, 43 unique visitors

2016 – **Bloss et al. (2016)**, Images of molecularly defined inhibitory interneurons and CA1 pyramidal cell dendrites collected using correlative light-electron microscopy and large-volume array tomography.
41 citations, 701 unique visitors

2016 – **Dyer et al. (2016)**, Mesoscale (1 cubic micron resolution) resolution images generated with the use of synchrotron X-ray microtomography (microCT) from millimeter-scale volumes of mouse brain. X-ray tomography promises rapid quantification of large brain volumes.
21 citations, 216 unique visitors

2016 – **Lee et al. (2016)**, Electron microscopy data collected at $4 \times 4 \times 40$ nm per voxel from the visual cortex in Mouse V1 used in a study of an excitatory network.
132 citations, 725 unique visitors

2016 – **Wanner et al. (2016**, Serial block face scanning EM (SBEM) and conductive sample embedding image stack from an olfactory bulb (OB) of a zebrafish larva at a voxel resolution of $9.25 \times 9.25 \times 25$ nm3.
12 citations, 328 unique visitors

2015 – **Amunts et al. (2015)**, BigBrain is an ultrahigh-resolution three-dimensional model of a full human brain at 20 micrometer resolution, enabling an unprecedented look into the human brain at micro- and macro-scopic scale.
262 citations, 1,041 unique visitors

2015 – **Bhatla et al. (2015)**, Nikhil Bhatla and Rita Droste in Bob Horvitz's Lab reconstruction of the anterior half of the C. elegans feeding organ, the pharynx. Volumes for three adult hermaphrodite worms include volumetric tracing of all neurons, selected cell types, I2 neuron synapses. 50 nm thick sections with an image resolution of 2 nm per pixel.
16 citations, 467 unique visitors

2015 – **Collman et al. (2015)**, Mouse cortex collected using conjugate array tomography (AT), a volumetric imaging method that integrates immunofluorescence and EM imaging modalities in voxel-conjugate fashion.
69 citations, 382 unique visitors

2015 – **Deisseroth et al. (2015)**, Twelve CLARITY mouse brains (5 wild type controls and 7 behaviorally challenged) were prepared by Li Ye, and imaged using CLARITY-Optimized Light-sheet Microscopy (COLM) (whole brain COLM imaging and data stitching performed by R. Tomer, in preparation).
5 citations, 208 unique visitors

2015 – **Harris et al. (2015)**, Three volumes of hippocampal CA1 neuropil in adult rat imaged by the laboratory of Kristen M Harris, PhD, at an XY resolution of 2 nm on serial sections of 50-60 nm thickness.
9 citations, 463 unique visitors

2015 – **Kasthuri et al. (2015)**, Saturated reconstruction of a sub-volume of mouse neocortex collected using automated technologies in which all cellular objects (axons, dendrites, and glia) and many sub-cellular components are rendered and itemized in a database. Provides access to the complexity of the neocortex and enables further data-driven inquiries.
323 citations, 1,299 unique visitors

2015 – **Micheva et al. (2015)**, Multi-channel array tomography data of the barrel cortex of an adult mouse (C57BL/6J).
57 citations, 190 unique visitors

2015 – **Ohyama et al. (2015)**, The side view of the approximately 7,000 neurons reconstructed so far, either in full or partially, of the approximately 12,000 neurons of the central nervous system of Drosophila larva. The 0111-8 data set was originally sectioned and imaged by Richard D. Fetter and his two tech assistants.
136 citations, 299 unique visitors

2015 – **Randlett et al. (2015)**, Zebrafish brain atlas with surface mesh of different regions intended for the analysis of whole-brain activity mapping.
124 citations, 498 unique visitors

2014 – **Weiler (2014)**, Images of whisker-associated barrel columns of mouse somatosensory cortex stained with antibodies against selected antigens (DAPI, YFP), and indirect immunofluorescence. Images collected by the lab of Stephen J Smith.
6 citations, 123 unique visitors

2013 – **Bumbarger et al. (2013)**, Serial, thin section data generated by Dan Bumbarger in Ralf Sommer's lab in order to compare the pharyngeal connectomes of the pharyngeal nervous system between Caenorhabditis elegans and Pristionchus pacificus. In P. pacificus they found clearly homologous neurons for all of the 20 pharyngeal neurons in C. elegans, and massive rewiring of synaptic connectivity between the two species.
67 citations, 22 unique visitors

2013 – **Takemura et al. (2013)**, The right part of the brain of a wild-type Oregon R female fly that was serially sectioned into 40-nm slices. A total of 1,769 sections, traversing the medulla and downstream neuropils, were imaged at a magnification of 35,000X.
323 citations, 144 unique visitors

2011 – **Bock et al. (2011)**, Volume of mouse primary visual cortical data, spanning layers 1, 2/3, and upper layer 4 collected as electron microscope (EM) data and two-photon microscopy data collected by Davi Bock, Ph.D. and Wei-Chung Allen Lee, Ph.D.. Images have a resolution of 4x4x45 cubic nanometers.
430 citations, 511 unique visitors