

Sambit Panda

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Education

- 2020 – **Ph.D in Biomedical Engineering**, *Johns Hopkins Medical Institute*, Baltimore, MD, USA.
Advisor: Joshua T. Vogelstein
- 2018 – 2020 **M.S.E. in Biomedical Engineering**, *Johns Hopkins University*, Baltimore, MD, USA.
- 2014 – 2018 **B.S. in Biomedical Engineering & Biology**, *NC State University & UNC Chapel Hill*, Raleigh, NC, USA.

Experience

- 01/19 – **Graduate Student**, *NeuroData, Department of Biomedical Engineering*, Johns Hopkins University, Baltimore, MD, USA, Baltimore, MD, USA.
- 01/15 – 05/18 **Research Assistant**, *Somers Lab, Department of Chemistry*, NC State University, Raleigh, NC, USA.
- 05/15 – 09/15 **Intern**, *Burleson Research Technologies*, RTP, NC, USA.
- 06/13 – 01/14 **Research Assistant**, *Jensen Lab*, National Institute of Environmental Health Sciences, RTP, NC, USA.

Publications

Journal Articles

- [2] Cencheng Shen, **Sambit Panda**, and Joshua T. Vogelstein. “The Chi-Square Test of Distance Correlation”. In: *Journal of Computational and Graphical Statistics* 31.1 (Jan. 2, 2022), pp. 254–262. ISSN: 1061-8600. DOI: [10.1080/10618600.2021.1938585](https://doi.org/10.1080/10618600.2021.1938585). pmid: [35707063](https://pubmed.ncbi.nlm.nih.gov/35707063/). URL: <https://doi.org/10.1080/10618600.2021.1938585>.
- [1] Leslie R. Wilson, **Sambit Panda**, Andreas C. Schmidt, and Leslie A. Somers. “Selective and Mechanically Robust Sensors for Electrochemical Measurements of Real-Time Hydrogen Peroxide Dynamics in Vivo”. In: *Analytical Chemistry* 90.1 (Jan. 2, 2018), pp. 888–895. ISSN: 0003-2700. DOI: [10.1021/acs.analchem.7b03770](https://doi.org/10.1021/acs.analchem.7b03770). URL: <https://doi.org/10.1021/acs.analchem.7b03770>.

Preprints

- [6] Eric W. Bridgeford, Michael Powell, Gregory Kiar, Stephanie Noble, Jaewon Chung, **Sambit Panda**, Ross Lawrence, Ting Xu, Michael Milham, Brian Caffo, and Joshua T. Vogelstein. “Batch Effects Are Causal Effects: Applications in Human Connectomics”. Oct. 14, 2022. DOI: [10.1101/2021.09.03.458920](https://doi.org/10.1101/2021.09.03.458920). URL: <https://www.biorxiv.org/content/10.1101/2021.09.03.458920v2>.
- [5] Haoyin Xu, Jayanta Dey, **Sambit Panda**, and Joshua T. Vogelstein. “Simplest Streaming Trees”. Mar. 8, 2022. DOI: [10.48550/arXiv.2110.08483](https://doi.org/10.48550/arXiv.2110.08483). arXiv: [2110.08483 \[cs\]](https://arxiv.org/abs/2110.08483). URL: <http://arxiv.org/abs/2110.08483>.
- [4] Haoyin Xu, Kaleab A. Kinfu, Will LeVine, **Sambit Panda**, Jayanta Dey, Michael Ainsworth, Yu-Chung Peng, Madi Kusmanov, Florian Engert, Christopher M. White, Joshua T. Vogelstein, and Carey E. Priebe. “When Are Deep Networks Really Better than Decision Forests at Small Sample Sizes, and How?” Nov. 2, 2021. DOI: [10.48550/arXiv.2108.13637](https://doi.org/10.48550/arXiv.2108.13637). arXiv: [2108.13637 \[cs, q-bio, stat\]](https://arxiv.org/abs/2108.13637). URL: <http://arxiv.org/abs/2108.13637>.

- [3] **Sambit Panda**, Satish Palaniappan, Junhao Xiong, Eric W. Bridgeford, Ronak Mehta, Cencheng Shen, and Joshua T. Vogelstein. “Hyppo: A Multivariate Hypothesis Testing Python Package”. Apr. 1, 2021. DOI: [10.48550/arXiv.1907.02088](https://doi.org/10.48550/arXiv.1907.02088). arXiv: [1907.02088](https://arxiv.org/abs/1907.02088) [cs, stat]. URL: <http://arxiv.org/abs/1907.02088>.
- [2] **Sambit Panda**, Cencheng Shen, Ronan Perry, Jelle Zorn, Antoine Lutz, Carey E. Priebe, and Joshua T. Vogelstein. “Nonpar MANOVA via Independence Testing”. Apr. 1, 2021. DOI: [10.48550/arXiv.1910.08883](https://doi.org/10.48550/arXiv.1910.08883). arXiv: [1910.08883](https://arxiv.org/abs/1910.08883) [cs, stat]. URL: <http://arxiv.org/abs/1910.08883>.
- [1] Cencheng Shen, **Sambit Panda**, and Joshua T. Vogelstein. “Learning Interpretable Characteristic Kernels via Decision Forests”. Sept. 11, 2020. DOI: [10.48550/arXiv.1812.00029](https://doi.org/10.48550/arXiv.1812.00029). arXiv: [1812.00029](https://arxiv.org/abs/1812.00029) [cs, stat]. URL: <http://arxiv.org/abs/1812.00029>.

Other Publications

- [1] **Sambit Panda**. “Multivariate Independence and K-Sample Testing”. Thesis. Johns Hopkins University, May 5, 2020. URL: <https://jscholarship.library.jhu.edu/handle/1774.2/62706>.

Software

- 12/19 – [scipy.stats.multiscale_graphcorr](#), Added a powerful multivariate independence test (multiscale graph correlation) to SciPy (the first such test).
- 09/18 – [hyppo \(originally mgcpy\)](#), Developed a multivariate hypothesis testing package in Python..

Presentations

Oral Presentations

- [6] **Sambit Panda**, Cencheng Shen, Ronan Perry, Jelle Zorn, Antoine Lutz, Carey E. Priebe, and Joshua T. Vogelstein. “Nonparametric MANOVA via Independence Testing”. In: Global Young Scientists Summit, Online, Jan. 2022. URL: <https://www.youtube.com/watch?v=rJyuTwkgfjQ&list=PLXusWh0JoRx-KFPi8PSVqnatHFG0zq65J&index=16>.
- [5] **Sambit Panda**, Sara Riley, Kendall Wiggins, Rahul Kathard, Trey Alredge, and Elliot Krause. “Developing Solutions for Hand Spasticity”. In: i4 Final Pitch, RTP, NC, USA, May 2018.
- [4] **Sambit Panda**, Leslie R. Wilson, and Leslie A Sombers. “Hydrogen Peroxide, Dopamine, and Serotonin: Overlapping Chemical Systems Contribute to the Control of Dyskinetic Movements in the Rat During Chronic L-DOPA Treatment for Parkinson’s Disease”. In: Honors Capstone Celebration, Raleigh, NC, USA, May 2018.
- [3] **Sambit Panda**, Sara Riley, Kendall Wiggins, Rahul Kathard, Trey Alredge, and Elliot Krause. “Developing Solutions for Hand Spasticity”. In: i4 Pitch 2, RTP, NC, USA, Feb. 2018.
- [2] **Sambit Panda**, Sara Riley, Kendall Wiggins, Rahul Kathard, and Trey Alredge. “Developing Solutions for Hand Spasticity”. In: i4 Pitch 1, RTP, NC, USA, Nov. 2017.
- [1] **Sambit Panda** and Sarah Lucas. “Surgical Site Infection Prevention”. In: i4 Pitch 2, RTP, NC, USA, Feb. 2016.

Abstracts/Poster Presentations

- [15] **Sambit Panda**, Cencheng Shen, Ronan Perry, Jelle Zorn, Antoine Lutz, Carey E. Priebe, and Joshua T. Vogelstein. “Nonparametric MANOVA via Independence Testing”. In: BRAIN PI Meeting, Online, June 2021.

- [14] Karen Butler, Christie A. Lee, Leslie R. Wilson, Tooba Rashid, **Sambit Panda**, Carl Meunier, and Leslie A Sombers. “Characterization of The Temporal and Spatial Dynamics of Electrically-Evoked H_2O_2 in the Extracellular Space of Rat Tissue”. In: Triangle Society for Neuroscience, RTP, NC, USA, May 2018. URL: https://www.trianglesfnchapter.org/_files/ugd/70b47c_ceaa288b748c455d9bc3e098645cfc5f.pdf#page=21.
- [13] **Sambit Panda**, Leslie R. Wilson, Andreas C. Schmidt, and Leslie A Sombers. “Highly Selective and Mechanically Robust Sensors for Electrochemical Measurements of Real-Time Hydrogen Peroxide Dynamics in vivo”. In: Triangle Society for Neuroscience, RTP, NC, USA, May 2018. URL: https://www.trianglesfnchapter.org/_files/ugd/70b47c_ceaa288b748c455d9bc3e098645cfc5f.pdf#page=31.
- [12] **Sambit Panda**, Sara Riley, Kendall Wiggins, Rahul Kathard, Trey Alredge, and Elliot Krause. “Developing Solutions for Hand Spasticity”. In: BME Design Symposium, RTP, NC, USA, Apr. 2018.
- [11] Leslie R. Wilson, **Sambit Panda**, and Leslie A Sombers. “Hydrogen peroxide-specific sensors for In vivo measurements using carbon-fiber microelectrodes”. In: Society for Neuroscience, Washington, DC, USA, Nov. 2017. URL: <https://www.abstractsonline.com/pp8/index.html#!/4376/presentation/19683>.
- [10] **Sambit Panda**, Leslie R. Wilson, and Leslie A Sombers. “Hydrogen Peroxide Specific Sensors For *In Vivo* Measurements Using Chronically Implanted Carbon-fiber Microelectrodes”. In: Summer UGR Symposium, Raleigh, NC, USA, Aug. 2017.
- [9] **Sambit Panda**, Leslie R. Wilson, and Leslie A Sombers. “Determining the Sources That Contribute to Extracellular Hydrogen Peroxide Dynamics in the Striatum”. In: Triangle Society for Neuroscience, RTP, NC, USA, Apr. 2017. URL: https://www.trianglesfnchapter.org/_files/ugd/70b47c_42aa665faa94404fb0f52646801378a7.pdf#page=28.
- [8] **Sambit Panda**, Leslie R. Wilson, and Leslie A Sombers. “Hydrogen peroxide specific sensors for *in vivo* measurements using chronically implanted carbon-fiber microelectrodes”. In: Spring UGR Symposium, Raleigh, NC, USA, Apr. 2017.
- [7] **Sambit Panda**, Leslie R. Wilson, and Leslie A Sombers. “Multiple Sources Contribute to Extracellular Hydrogen Peroxide Dynamics in the Striatum”. In: Keck Center for Behavioral Biology Conference, Raleigh, NC, USA, Dec. 2016.
- [6] **Sambit Panda**, Leslie R. Wilson, Andreas C. Schmidt, and Leslie A Sombers. “Multiple sources contribute to extracellular H_2O_2 dynamics in the striatum”. In: Society for Neuroscience, San Diego, CA, USA, Nov. 2016. URL: <https://www.abstractsonline.com/pp8/index.html#!/4071/presentation/22335>.
- [5] **Sambit Panda**, Leslie R. Wilson, and Leslie A Sombers. “Multiple Sources Contribute to Extracellular H_2O_2 Dynamics in the Striatum”. In: Summer UGR Symposium, Raleigh, NC, USA, Aug. 2016.
- [4] **Sambit Panda**, Leslie R. Wilson, and Leslie A Sombers. “Determining the Sources That Contribute to Extracellular Hydrogen Peroxide Dynamics in the Striatum”. In: Triangle Society for Neuroscience, RTP, NC, USA, Apr. 2016. URL: https://www.trianglesfnchapter.org/_files/ugd/70b47c_42aa665faa94404fb0f52646801378a7.pdf#page=28.
- [3] Sam Smith, Christie A. Lee, Will Garrison, **Sambit Panda**, Anna Komsa, and Leslie A Sombers. “Determining the Sources That Contribute to Extracellular Hydrogen Peroxide Dynamics in the Striatum”. In: Triangle Society for Neuroscience, RTP, NC, USA, Apr. 2016. URL: https://www.trianglesfnchapter.org/_files/ugd/70b47c_60cc78ed608f4a4b94be7b08e4c1d641.pdf#page=26.
- [2] **Sambit Panda**, Leslie R. Wilson, and Leslie A Sombers. “Determining the Sources That Contribute to Extracellular H_2O_2 Dynamics in the Striatum”. In: Spring UGR Symposium, Raleigh, NC, USA, Apr. 2016.

- [1] Leslie R. Wilson, Christie A. Lee, Catie F. Rhodes Nastassja D. Mason, **Sambit Panda**, and Leslie A Sombers. "Real-time measurements of oxidative stress during chronic L-DOPA treatment for Parkinson's disease". In: Society for Neuroscience, Chicago, IL, USA, Oct. 2015. URL: <https://www.abstractsonline.com/Plan/ViewAbstract.aspx?sKey=f7322ce4-3ce9-4a96-95fc-dc84baed5a3d&cKey=e71f7ee9-bb9a-49fe-aef0-ad1ff6557826&mKey=d0ff4555-8574-4fbb-b9d4-04eec8ba0c84>.

Awards & Honors

- 2020 **Computational Biology Fellowship**, *Johns Hopkins University*, Baltimore, MD, USA.
- 2018 **AWS IMAGINE Grant**, *Amazon Web Services*, USA.
Supported the `mgcpy` (now `hyppo`) package.
- 2018 **Magna Cum Laurde**, *NC State University*, Raleigh, NC, USA.
- 2018 **University Honors Program Graduate**, *NC State University*, Raleigh, NC, USA.
- 2014 – 2018 **Dean's List**, *NC State University*, Raleigh, NC, USA.
- 2018 **Outstanding Capstone Award**, *University Honors Program, NC State University*, Raleigh, NC, USA.
- 2018 **Undergraduate Poster Award**, *Triangle Society for Neuroscience*, RTP, NC, USA.
- 2017, 2018 **1st Place for Pitch**, *i4 Pitch Competition*, RTP, NC, USA.
Supported prototyping for my senior design project "Developing Solutions for Hand Spasticity"
- 2014, 2016, **Goodnight Scholars Enrichment Grants**, *NC State University*, Raleigh, NC, USA.
2017 Supported a the first year of the Ramchandra Panda Scholarship & summers working for my lab (year 3 & 4).
- 2015 **1st Place for Pitch**, *i4 Pitch Competition*, RTP, NC, USA.
Supported prototyping for the project "Surgical Site Infection Prevention"
- 2014 **Goodnight Scholarship**, *NC State University*, Raleigh, NC, USA.
- 2014 **National Merit Corporate Scholarship**, *National Merit Scholarship Corporation*, USA.

Teaching

- Spring '22 **Teaching Assistant**, *JHU*, *EN.580.238/438/638*, [NeuroData Design II](#).
- Fall '21 **Teaching Assistant**, *JHU*, *EN.580.237/437/697*, [NeuroData Design I](#).
- Spring '21 **Teaching Assistant**, *JHU*, *EN.580.238/438/638*, [NeuroData Design II](#).
- Fall '20 **Teaching Assistant**, *JHU*, *EN.580.237/437/697*, [NeuroData Design I](#).
- Fall '17 **Teaching Assistant**, *NC State*, *BME 201*, Computer Methods in Biomedical Engineering.
- Spring '17 **Teaching Assistant**, *NC State*, *BME 210*, Biomedical Electronics.

Service

Research Service

- 11/22 **Reviewer**, *SoftwareX*.
- 3/22 – **Life Sciences Advisor**, [A-Level Capital](#).
Advise students and source early-stage life sciences companies.
- 2021 **Co-Chair**, *SciPy mini-symposium: Biology and Neuroscience*, Online.
- 2021 **Reviewer**, *SciPy track: Scientific Applications of Machine Learning and Data Science*, Online.
- 2020 **Co-Chair**, *SciPy mini-symposium: Scientific Applications of Biology and Bioinformatics*, Online.
- 2020 **Reviewer**, *SciPy track: Machine Learning and Data Science*, Online.

Other Service

- 2014 – 2018 **Various**, *Goodnight Scholars Program*, Raleigh, NC, USA, Committee Chair/Member, Ambassador, Mentor, Tutor, and Senior Gift Member. Many events also revolved around service..

- 10/17 – 02/18 **Neurosciences Hospital Volunteer**, *UNC Healthcare*, Chapel Hill, NC, USA.
- 12/17 **Student Volunteer**, *FIMRC*, Kodaikanal, Tamil Nadu, India.
- 06/12 – **President**, *Ramchandara Panda Scholarship Trust*, Sahupada, Orissa, India, The mission for this trust is to provide rural students the opportunity to build a better education by providing a monetary investment and by helping preserve traditions for future generations. It began as a math competition given to 50 rural students in home-village in India. It has now grown to 300+ students in both the village and neighboring town specializing in math, traditional Indian dance, art, and music..