

# Sambit Panda

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## SUMMARY

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- PhD candidate with experience in data science, machine learning, neuroscience, and genomics
- Author of 11 publications (h-index: 6)
- Interdisciplinary collaborator with experience working in clinical and translational settings

## WORK EXPERIENCE

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### NeuroData, Johns Hopkins

Jan 2019 – Present

*Graduate Researcher*

*Baltimore, MD*

- Wrote 9 publications related to hypothesis testing, causal inference, and random forest extensions.
- Developed and maintained `hyppo` (about 50 users and 200 stars) and `scikit-tree` (about 50 stars) open-source Python software packages and ported some algorithms in SciPy.
- Presented work at top conferences like the BRAIN Initiative meeting and chaired/reviewed for the SciPy conference.
- Reviewed a paper for the SoftwareX journal, advised the venture capitalist firm A-Level Capital, and was a TA for the NeuroData Design I & II research class for two years.

### Neurobehavioral Core, NIEHS

May 2023 – Jul 2023

*Data Science Intern*

*RTP, NC*

- Applied algorithms from my PhD work that discovered new relationships in the data; got 1st place at the poster conference for work.
- Wrote 2 publications related to neuroscience and a R package.

### Somers Lab, NC State

Jan 2015 – May 2018

*Research Assistant*

*Raleigh, NC*

- Created a new electrochemical sensor and wrote paper about it in ACS Analytical Chemistry.
- Investigated the chemical basis of abnormal involuntary movements (AIMs) during Parkinson's Disease.
- Presented research at top conferences like society of neuroscience (SfN) and Pittcon.
- Analyzed data and engineered numerous solutions for numerous additional projects.

### Burleson Research Technologies

May 2015 – Sep 2015

*Intern*

*RTP, NC*

- Tested pharmaceutical drugs on rats and mice through various methods such as oral gavage, *i.p.*, and *i.v.*
- Helped lab run under good laboratory practices.

### Developmental Neurobiology Group, NIEHS

Jun 2013 – Jan 2014

*Research Assistant*

*RTP, NC*

- Trained in several basic genetics and neuroscience techniques such as PCR, gel electrophoresis, etc.

## PROJECTS

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### `scikit-tree` | *Python, Cython, GitHub Actions*

2023 – Present

- Helped develop the package for extensions of scikit-learn decision trees (about 50 stars).

### `hyppo (originally mgcpy)` | *Python, CircleCI, Netlify, Codecov, AWS, Azure*

2018 – Present

- Developed and maintained a comprehensive multivariate hypothesis testing package in Python (about 50 users and 200 stars).

### `FiPhA` | *R, Shiny*

2023

- Helped develop one of the most robust and user-friendly packages for fiber photometry analysis.

### `scipy.stats.multiscale_graphcorr` | *Python, Cython*

2019

- Added Multiscale Graph Correlation, a powerful multivariate independence test, to SciPy (the first such test).

## SKILLS

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**Languages:** Python, R, MATLAB, JavaScript, HTML/CSS, C/C++, Java

**Developer Tools:** Git, Docker, CircleCI, TravisCI, Codecov, Coveralls, AWS, Azure, VS Code

**Libraries:** pandas, NumPy, SciPy, Matplotlib, seaborn, scikit-learn

## EDUCATION

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### Johns Hopkins University

*PhD, Biomedical Engineering*

*MSE, Biomedical Engineering*

**Baltimore, MD**

2020 – Present

2018 – 2020

### NC State University & UNC Chapel Hill

*BS, Biomedical Engineering & Biology*

**Raleigh & Chapel Hill, NC**

2014 – 2018

## SELECT PUBLICATIONS (5 of 11)

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1. Shen, C., **Panda, S.**, & Vogelstein, J. T. (2022). The Chi-Square Test of Distance Correlation. *Journal of Computational and Graphical Statistics*, 31(1), 254–262. <https://doi.org/10.1080/10618600.2021.1938585>
2. **Panda, S.**, Palaniappan, S., Xiong, J., Bridgeford, E. W., Mehta, R., Shen, C., & Vogelstein, J. T. (2021). *hyppo: A Multivariate Hypothesis Testing Python Package* (arXiv:1907.02088). arXiv. <https://doi.org/10.48550/arXiv.1907.02088>
3. **Panda, S.**, Shen, C., Perry, R., Zorn, J., Lutz, A., Priebe, C. E., & Vogelstein, J. T. (2021). *Nonpar MANOVA via Independence Testing* (arXiv:1910.08883). arXiv. <https://doi.org/10.48550/arXiv.1910.08883>
4. Shen, C., **Panda, S.**, & Vogelstein, J. T. (2020). *Learning Interpretable Characteristic Kernels via Decision Forests* (arXiv:1812.00029). arXiv. <https://doi.org/10.48550/arXiv.1812.00029>
5. Wilson, L. R., **Panda, S.**, Schmidt, A. C., & Sombers, L. A. (2018). Selective and Mechanically Robust Sensors for Electrochemical Measurements of Real-Time Hydrogen Peroxide Dynamics in Vivo. *Analytical Chemistry*, 90(1), 888–895. <https://doi.org/10.1021/acs.analchem.7b03770>

## SELECT PRESENTATIONS (6 of 21)

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1. **Panda, S.**, Wilson, L. R., Stallone, J., Kendricks, D., Stevanovic, K., & Cushman, J. D. (2023, July). *Elucidating Relationships within Neurological Screening Batteries via Random Forest-Based Hypothesis Testing* [Poster Presentation] RTP, NC, USA.
2. **Panda, S.**, Shen, C., Perry, R., Zorn, J., Lutz, A., Priebe, C. E., & Vogelstein, J. T. (2022, January). *Nonparametric MANOVA via Independence Testing* [Oral Presentation]. Global Young Scientists Summit, Virtual. <https://www.youtube.com/watch?v=rJyuTwkgfjQ>
3. **Panda, S.**, Shen, C., Perry, R., Zorn, J., Lutz, A., Priebe, C. E., & Vogelstein, J. T. (2021, June). *Nonparametric MANOVA via Independence Testing* [Poster Presentation] BRAIN Initiative Meeting, Virtual.
4. **Panda, S.**, Wilson, L. R., & Sombers, L. A. (2018, February). *Hydrogen peroxide-specific sensors for In vivo measurements using carbon-fiber microelectrodes* [Poster Presentation] Pittcon, Orlando, FL, USA.
5. Wilson, L. R., **Panda, S.**, & Sombers, L. A. (2017, November). *Hydrogen peroxide-specific sensors for In vivo measurements using carbon-fiber microelectrodes* [Poster Presentation] Society for Neuroscience, Washington, DC, USA. <https://www.abstractsonline.com/pp8/index.html#!/4376/presentation/19683>
6. **Panda, S.**, Wilson, L. R., Schmidt, A. C., & Sombers, L. A. (2016, November). *Multiple sources contribute to extracellular H2O2 dynamics in the striatum* [Poster Presentation] Society for Neuroscience, San Diego, CA, USA. <https://www.abstractsonline.com/pp8/index.html#!/4071/presentation/22335>

## AWARDS & HONORS

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<b>Computational Biology Fellowship</b> , Johns Hopkins University	2020
<b>AWS IMAGINE Grant</b> , Amazon Web Services (Supported the mgcpy (now hyppo) package)	2018
<b>Magna Cum Laude</b> , NC State University	2018
<b>University Honors Program</b> , NC State University	2018
<b>Dean's List</b> , NC State University	2014 – 2018
<b>Enrichment Grants</b> , Goodnight Scholars Program, NC State University	2014 – 2018
<b>Goodnight Scholarship</b> , NC State University	2014
<b>National Merit Corporate Scholarship</b> , National Merit Scholarship Corporation	2014