

# JENNIFER STISO

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## EDUCATION

### University of Pennsylvania

PhD Computational Neuroscience

January 2021  
Philadelphia, PA

### University of California Berkeley

BA Molecular and Cellular Biology; Cognitive Science

June 2016  
Berkeley, CA

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## Positions

### Postdoctoral Researcher

Complex Systems Group (Prof. Danielle Bassett)  
Computational social science

Jan 2021 – Present  
Philadelphia, PA

### PhD Candidate

Complex Systems Group (Prof. Danielle Bassett)  
Computational neuroscience

June 2017 – Jan 2021  
Philadelphia, PA

### Intern for Intelligent Systems Branch of Research and Exploratory Development

Johns Hopkins University Applied Physics Lab  
Computational neuroscience

July 2020 – Oct 2020  
Columbia, MD

### Consultant for Medical Device Startup

Penn Biotech Group  
Mental Healthtech

Aug 2019 - Jan 2020  
Philadelphia, PA

### Rotation Student

University of Pennsylvania, (PI Prof. Sharon Thompson-Schill & Prof. Timothy Lucas)  
Cognitive neuroscience

Aug 2016 - June 2017  
Philadelphia, PA

### Undergraduate Researcher

Knight Laboratory (Prof. Robert Knight) Cognitive Action Laboratory (Prof. Richard Ivry)  
Cognitive neuroscience

Feb 2014 - Aug 2016  
Berkeley, CA

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## SKILLS

- **Programming:** Python, R, MATLAB, Javascript, SQL, Java, Latex
- **Fields:** neuroscience, graph theory, control theory, machine learning, dynamical systems, psychology
- **Interpersonal Skills:** communication, time management, organization

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## PUBLICATIONS

### Articles

Published

- **Stiso, J.** (2021) Data-based and theory-based network models of perturbations to neural dynamics (Order No. 28316226). Available from Dissertations & Theses @ University of Pennsylvania; ProQuest Dissertations & Theses Global. (2533342668).

- Wang, X., Dworkin, J., Zhou, D., **Stiso, J.**, Falk, E., Zurn, P., Bassett, D.S., Lydon-Staley, D. (2021). Gendered Citation Practices in the Field of Communication. *Annals of the International Communication Association*.
- Matelsky, J., Reilly, E.P., Johnson, E., **Stiso, J.**, Bassett, D.S., Wester, B., & Gray-Roncal, W. (2021). DotMotif: an open-source tool for connectome subgraph isomorphism search and graph queries. *Sci Rep*. <https://doi.org/10.1038/s41598-021-91025-5>
- Scheid, B. H., Ashourvan, A., **Stiso, J.**, Davis, K.A., Mikhail, F., Pasqualetti, F., Litt, B., Bassett, D.S. (2021). Time-evolving controllability of effective connectivity networks during seizure progression. *PNAS*
- **Stiso, J.**, Corsi, M.C., Vettel, J.M., Garcia, J.O., de Vico Fallani, F., Lucas, T.H. and Bassett, D. S. Learning in brain-computer interface control evidenced by joint decomposition of brain and behavior. (2020). *Journal of Neural Engineering*. doi:10.1088/1741-2552/ab9064
- Cui Z., **Stiso, J.**, Baum, G.L., Kim, J.Z., Roalf, D.R., Betzel, R.F., Gu, S., Lu, Z., Xia, C.H., Ciric, R., Moore, T.M., Shinohara, R.T., Ruparel, K., Davatzikos, C., Pasqualetti, F., Gur, R.E., Gur, R.C., Bassett, D.S., Satterthwaite, T.D. (2020). Optimization of Energy State Transition Trajectory Supports the Development of Executive Function During Youth. *eLife*, 9, e53060.
- Karrer, T.M., Kim, J.Z., **Stiso, J.**, Kahn, A.E., Pasqualetti, F., Habel, U. and Bassett, D.S. (2019). A practical guide to methodological considerations in the controllability of structural brain network. *Journal of Neural Engineering*, 17 (2), 026031.
- Stacey, W., Kramer, M., Gunnardottir, K., Gonzalez-Martinez, J., Zaghoul, K., Inati, S., Sarma, S., **Stiso, J.**, Khambhati, A., Bassett, D.S., Smith, R., Liu, V., Lopour, B., and Staba, R. (2019). Merging ROles for Network Science in Epilepsy. *Epilepsy Research*. doi:10.1016/j.eplepsyres.2019.106255
- **Stiso, J.**, Khambhati, A. N., Menara, T., Kahn, A. E., Stein, J. M., Das, S. R., Gorniak, R., Tracy, J., Litt, B., Davis, K.A., Pasqualetti, F., Lucas, T.H., Bassett, D. S. (2019). White Matter Network Architecture Guides Direct Electrical Stimulation Through Optimal State Transitions. *Cell Reports*, 28(10), 2554-2566.
- **Stiso, J.**, Bassett, D. S. (2018). Spatial Embedding Imposes Constraints on the Network Architectures of Neural Systems. *Trends in Cognitive Science*, 22(12), 1127-1142.
- Buch, V.P., Richardson, A.G., Brandon, C., **Stiso, J.**, Khattak, M.N., Bassett, D.S., Lucas, T.H. (2018) Network brain-computer interface (nBCI): An alternative approach for cognitive prosthetics. *Frontiers in Neuroscience*. 12(790).
- Perry, A., Saunders S., **Stiso, J.**, Dewar, C., Lubell, J., Meling, T., Endestad, T., Solbakk, A.K., & Knight, R.T. (2017). Effects of Prefrontal Cortex Damage on Action and Emotion Understanding: EEG and behavioral evidence. *Brain*, 140(4), 1086–1099.
- Perry, A., **Stiso, J.**, Chang, E. F., Lin, J. J., Parvizi, J., & Knight, R. T. (2017). Mirroring in the Human Brain: Deciphering the Spatial-Temporal Patterns of the Human Mirror Neuron System. *Cerebral Cortex*, 1–10.
- **Stiso, J.**, & Perry, A. (2016). How Do We Understand Other People? *Frontiers for Young Minds*, 4(September).

In Press

- **Stiso, J.**, Lynn, C. W., Kahn, A. E., Rangarajan, V., Szymula, K., Revell, A., Litt, B., Davis, K.A., Lucas, T.H., & Bassett, D. S. (2021). Neurophysiological evidence for temporally discounted cognitive map formation during sequence learning. *eNeuro*.

In Revision

- Qian, W., Lynn, C. W., Klshin, A. A., **Stiso, J.**, Christianson, N. H., & Bassett, D. S. (2021). Optimizing the Human Learnability of Abstract Network Representations. <http://arxiv.org/abs/2111.12236>

- **Stiso, J.**, Caciagli, L., Hadar, P., Davis, K.A., Lucas, T.H., & Bassett, D.S. (2021). Fluctuations in functional connectivity associated with interictal epileptiform discharges (IEDs) in intracranial EEG. *BiorXiv*.
- He, X., Caciagli, L., Parkes, L., **Stiso, J.**, Karrer, T. M., Kim, J. Z. & Bassett, D. S. (2021). Title : Pathological and metabolic underpinnings of energetic inefficiency in temporal lobe epilepsy, *BiorXiv*. 1–37.
- Bertolero, M.A., Dworkin, J.D., **Stiso, J.**, David, S., Lopez, C.L., Srivastava, P., Zhou, D., Dzirasa, K., Fair, D., Kasczkurkin, Marlin, B.J., Shomhamy, D., Uddin, L., Zurn, P., & Bassett, D. S. (2020). Racial imbalance in neuroscience reference lists and intersections with gender. *ArXiv*.
- Nozari, E., **Stiso, J.**, Caciagli, L., Cornblath, E.J., He, X., Bertolero, M.A., Mahadevan., A., Pappas, G., & Bassett, D.S. (2020). Is the brain macroscopically linear? *ArXiv*.

In preparation

- **Stiso, J.**, Oudyk, K., Zurn, P., & Bassett, D.S. (2022). A model of gender bias in academic citations.
- **Stiso, J.**, Pluta, W., Zhou, D., Dine, J., & Bassett, D.S. (2022). A text-based analysis of gender and racial/ethnic bias in medical school performance evaluations.

## Book Chapters

- Bassett, D.S., **Stiso, J.** Spatial Brain Networks. Invited as a chapter in the volume entitled “Spatial Networks” from Comptes-rendus Academie des sciences. doi:10.1016/j.crhy.2018.09.006

## Tools

- **Stiso, J.**, Parkes, L. and Kim, J.Z. [Network Control Python package](#).
- **Stiso, J.**, Schaff, M. [Citation Transparency Chrome Extension](#).
- Zhou, D., **Stiso, J.**, Cornblath, E.J., Teich, E.G., Dworkin, J.D., Blevins, A.S. and Bassett, Danielle S. (2020, February 17). Gender Diversity Statement and Code Notebook v1.0 (Version v1.0). Zenodo. <http://doi.org/10.5281/zenodo.3672110>

## Press

- ["Penn Researchers' Model Optimizes Brain Stimulation Therapies, Improving Memory in Tests"](#). Penn Engineering Medium Article

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## Presentations

### Invited Talks

External

- **Effects of interictal epileptiform discharges on electrocorticography-derived functional networks**. BRAIN Initiative Investigators Meeting. Virtual. 2020
- **Effects of interictal epileptiform discharges on electrocorticography-derived functional connectivity**. Women in Data Science Conference. Philadelphia, PA. 2020
- **Network Models of Brain Structure, Function, and Control**. Organization for Human Brain Mapping - data science in neuroscience symposium. Rome, Italy. 2019
- **Using Control Theory to Model Direct Electrical Brain Stimulation**. Networks in Big Data and Personalized Medicine Satellite. Paris, France. 2018
- **Network Science Approaches to Neural Function in Epilepsy**. American Epilepsy Society - Engineering and Neurostimulation Special Interest Group. New Orleans, LA. 2018
- **Large-scale Control of Human Brain Structural Networks: applications in direct electrical stimulation**. Society for Neuroscience Mini symposium - Exposing Neural Dynamics Using Real-Time

Control: From Neurons to Human Behavior and Psychopathy. San Diego, CA. 2018

- **Towards a Mathematical Model of Direct Electrical Brain Stimulation.** Topology in Biology Seminar. Philadelphia, PA. 2018

Internal

- **A Model of Gender Bias in Academic Citations.** Addiction, health, and adolescence group meeting. 2021
- **Effects of interictal epileptiform discharges on human electrocorticography derived functional connectivity.** Neuroscience Training Grant Retreat. 2020
- **Human Learning: from network theory to neural correlates.** Neuroscience Graduate Group Recruitment. 2020
- **Barriers to Open Science in Graduate School.** Open Science Week panel. 2019
- **Investigating the Role of the Hippocampus in Higher-order Statistical Learning.** Collaborative ECoG research protocol meeting. 2019
- **Network Models of Brain Structure, Function, and Control.** Graduate Research in Progress Seminar. 2019
- **Investigating the Neurophysiological Correlates of Higher-order Statistical Learning in Humans.** CNI +/- . 2018
- **Towards a Mathematical Model of Direct Electrical Brain Stimulation.** Graduate Research in Progress Seminar. 2018

## Posters

- Nozari, E., **Stiso, J.**, Caciagli, L., Cornblath, E.J., He, X., Bertolero, M.A., Mahadevan., A., Pappas, G., & Bassett, D.S. (2020). Is the brain macroscopically linear? CoSyNe, Virtual (2021)
- Tobin, M., Wood, K., **Stiso, J.**, Bassett, D.S., & Geffen, M. Role of interneurons in populations' neural coding and network properties in auditory cortex. APAN, Virtual (2020)
- **Stiso, J.**, Caciagli, L., Hadar, P., Davis, K.A., Lucas, T.H., Bassett, D. S. Effects of Inter-ictal epileptiform discharges on electrocorticography based functional connectivity. Presentation at OHBM, Virtual (2020)
- **Stiso, J.**, Corsi, M.C., Vettel, J.M., Garcia, J.O., de Vico Fallani, F., Bassett, D. S. Dynamic functional beta-band connectivity during BCI learning drives brain activity to support sustained attention. Presented at OHBM, Rome (2019)
- He, X., **Stiso, J.**, Kim, J.Z., Lu, Z., Cornblath, E.J., Menara, T., Pasqualetti, F., Sperling, M.R., Tracy J.I., Bassett, D.S. Characterizing the optimal control energy trajectory in temporal lobe epilepsy. Presented at OHBM, Rome (2019)
- Cui Z., **Stiso, J.**, Baum, G.L., Kim, J.Z., Roalf, D.R., Betzel, R.F., Gu, S., Lu, Z., Xia, C.H., Ciric, R., Moore, T.M., Shinohara, R.T., Ruparel, K., Davatzikos, C., Pasqualetti, F., Gur, R.E., Gur, R.C., Bassett, D.S., Satterthwaite, T.D. (2018). Optimization of Energy State Transition Trajectory Supports the Development of Executive Function During Youth. Presented at OHBM, Rome (2019)
- Buch V. P., Brandon C., Archer R., **Stiso, J.**, Rammayya A., Yang A., Richardson, A. G., Bassett, D.S., Lucas, T.H. Novel inter-trial resting state network analysis can reliably predict learning and performance of a simple cognitive reaction time task. American Association of Neurological Surgeons. San Diego (2019)
- **Stiso, J.**, Khambhati, A. N., Menara, T., Kahn, A. E., Stein, J. M., Das, S. R., ... Bassett, D. S. White Matter Network Architecture Guides Direct Electrical Stimulation Through Optimal State Transitions. Presented at NetSci, Paris (2018), Computational Cognitive Neuroscience, Philadelphia (2018) and Society for Neuroscience, San Diego (2018)
- **Stiso, J.**, Hudgins E., Brandon C., Williams S., Richardson A., Kelz M., Proekt A., Lucas T. Intracranial

Recordings Applied Towards a Better Predictor of Unconscious States. Presented at Congress of Neurological Surgeons (2017)

- Perry, A., Saunders S., **Stiso, J.**, Dewar, C., Lubell, J., Meling, T., Endestad, T., Solbakk, A.K., & Knight, R.T. Effects of prefrontal cortex damage on emotion understanding. Presented at CNS, San Francisco (2017)
- Perry, A., **Stiso, J.**, Dewar, C., Lin, J.J., Knight, R.T. The role of the orbitofrontal cortex in regulation of interpersonal space. Presented at SfN conference, San Diego (2016)
- Perry, A., **Stiso, J.**, Chang, E. F., Lin, J. J., Parvizi, J., & Knight, R. T. Perception through action: Where and When. Presented at the SfN conference (2015) and California Cognitive Science Conference (2016)
- Perry, A., **Stiso, J.**, Chang, E.F., Schalk, G., Brunner, P., Lin, J.J., Knight, R.T. Viewing and Imitating Goal Directed Actions. Presented at the SfN (2014) and the California Cognitive Science conference (2015)

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#### HONORS AND AWARDS

**Ruth L. Kirschstein National Research Service Award (NRSA F31)** 2020  
University of Pennsylvania

**Blavatnik Fellowship Finalist** 2019  
University of Pennsylvania

**Jameson Hurvich Travel Award** 2019  
University of Pennsylvania

**Google PhD Fellowship Internal Nominee** 2018  
University of Pennsylvania

**Systems and Integrative Biology T32** 2016  
University of Pennsylvania

**NSF GRFP Honorable Mention** 2016  
National

**Robert J. Glushko Prize** 2015  
University of California, Berkeley

**SURF L&S Fellowship** 2014  
University of California, Berkeley

**Goldberg Undergraduate Research Fellowship** 2013  
University of California Berkeley

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#### TEACHING

**Teaching Assistant** 2019 - 2020

- Taught and developed material for graduate level Python bootcamp. This bootcamp also included two lessons on neural networks with Keras.
- Teaching assistant for introduction to the biological basis of behavior (BBB109) at the University of Pennsylvania.

**Tutor** 2020-2021

- Data science tutor for UPenn MindCore

## Guest Lecture

2019 - 2021

- Taught lecture on applications of network control theory to neuroscience to graduate level network neuroscience course (BE566)
- Taught guest lecture on learning memory in high school summer neuroscience class offer through Upward Bound.

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## Community Involvement

### Outreach and Diversity

2019 - Present

Diversity and Inclusion in Science

- Served as student organizer for the Innovators in Cognitive Neuroscience seminar series.
- Served advisory committee for the first annual BiasWatchNeuro conference.
- Led committee to diversify portraits of scientists present in neuroscience spaces, especially those that trainees spend a substantial amount of time in.
- Curated database of black scientists in STEM as a resource for conference organizers who prioritize diversity ([blackinstem.net](http://blackinstem.net))
- Contributed code for chrome extension (main contributor) and binder to help combat biases in citation practices.

2016 - 2020

Graduate Led Initiatives and Activities

- Elected secretary in 2019
- Elected co-director in 2018; negotiated funding increases from three different sources, totaling a 41% increase in funds.
- Elected chair of professional development in 2017; managed several subcommittees, accountable for professional development budget and introduced a new undergraduate mentor program.
- Volunteered to teach high school students neuroscience and research in general as part of Upward Bound, volunteered at the Philadelphia Science Festival.
- Developed and designed a networking website for neuroscience students and alumni from Penn.

2019 - 2020

Penn Network Visualization Organization

- Organizing committee for week long internship program for high school artists in the Philadelphia areas to learn about science and create science inspired pieces for their portfolio.

2013 - 2014

Cognitive Science Students Association

- Taught basic neuroscience to elementary school students; planned annual conference for undergraduate and graduate researchers in cognitive science.

## Professional Memberships

Present

- Penn Biotech Group (2019)
- Society for Neuroscience (2018)
- Penn Data Science Group (2017)
- Graduate Led Initiatives and Activities (2016)

## Peer Reviewer

2018 - Present

- *Nature Communications, Journal of Nonlinear Science, NeuroImage*

## Journal Clubs

2017 - 2020

- Organized the Cognitive Neuroscience and Neuroimaging journal club at Penn. This included administrative roles as well as presenting at least once per semester.

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## Coursework

- **Math and Computer Science:** computational models of cognition, data structures, data science, discrete mathematics, linear algebra, machine learning (including neural networks), statistics
- **Biology and Social Science:** biochemistry, biophysics, electricity and magnetism, genetics, linguistics, organic chemistry, perception, philosophy of mind, neurobiology, and neuropsychology