

Evan Dastin-van Rijn
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Education

University of Minnesota-Twin Cities

PhD in Biomedical Engineering, Translational Neuroengineering Lab

Minneapolis, MN

Fall 2021-Present

Brown University

Bachelor of Science in Biomedical Engineering and Neuroscience

Magna cum laude, Honors in Biomedical Engineering

Cumulative GPA 4.0/4.0

Providence, RI

Fall 2017-Spring 2021

St. John's International School

43 points in the IB Diploma (HL: Chemistry, Math, Physics, Philosophy)

Waterloo, Belgium

Fall 2015-Spring 2017

Research Experience

PhD Student, Translational Neuroengineering Lab

09/2022-Present

- Developed a black-box optimization platform to determine ideal stimulation parameters for enhancing cognitive variables
- Developed computational models to better understand the effect of striatal stimulation in a behavioral task probing cognitive flexibility in rats
- Developed a streamlined software platform for integrating behavioral tasks in operant chambers, electrophysiological recordings, video, and stimulation
- Developed new hardware for communicating between operant chambers and behavioral task software according to industry standards

Research Assistant, Borton Laboratory

09/2018-08/2021

Assisted with a study working towards the development of an adaptive system to treat symptoms of OCD using deep brain stimulation (DBS)

- Developed Period-based Artifact Reconstruction and Removal Method (PARRM), a novel method for neurostimulation artifact removal showing improved performance over existing, state-of-the-art methods
- Developed Period Estimation of Lost Packets (PELP), a solution to temporal alignment of packet losses occurring during recordings with implanted bidirectional stimulators
- Analyzed and evaluated approaches to data imputation to enable interpretation of neural timeseries with missing samples
- Performed neural data analysis that was used to meet NIH milestones
- Programmed a cognitive control task using jsPsych for use in the clinic and at home settings
- Developed a neural and video data preprocessing pipeline for accurate temporal alignment of multimodal data streams
- Developed programs and workflows to aid in data validation and quality assurance

Research Assistant, Learning, Memory & Decision Lab

05/2020-08/2021

Developed a series of computational models in MATLAB to determine and analyze differences in latent structure learning measured using a computer-based behavioral task

Research Assistant, Salomon Laboratory

05/2018-08/2018

Using Java, FileMaker, and R, incorporated the industry standard software package Maxquant into the laboratory's software pipeline.

Student, Phage Hunters

08/2017-05/2018

Designed an algorithm to generate PCR primers particular to specific bacteriophage clusters to aid in identification prior to sequencing. Primers successfully clustered more than 1500 different bacteriophage both theoretically and in practice.

Skills and Training

Programming: MATLAB, JavaScript, Java, Android, Python, HTML/CSS, Git

Software: Adobe Suite, Solidworks, Simulink, Microsoft Office

Lab: Electroencephalography, electrocardiography, circuit/PCB design, rat handling, task shaping

Publications

- **Evan M. Dastin-van Rijn**, Elizabeth Sachse, Francesca Iacobucci, Megan Mensinger, Alik S. Widge. 2023. OSCAR: an open-source controller for animal research. (*bioRxiv*)
- Paula Chen, Taewoo Kim, **Evan Dastin-van Rijn**, Nicole R. Provenza, Sameer A. Sheth, Wayne K. Goodman, David A. Borton, Matthew T. Harrison, Jerome Darbon., 2022. Periodic Artifact Removal with Applications to Deep Brain Stimulation. (*Transactions on Neural Systems & Rehabilitation Engineering*)
- **Evan M. Dastin-van Rijn**, Nicole R. Provenza, Wayne K. Goodman, Matthew T. Harrison, David A. Borton., 2022. PELP: accounting for missing data in neural time series by Periodic Estimation of Lost Packets. (*Frontiers in Human Neuroscience*)
- **Evan M. Dastin-van Rijn**, Seth D. König, Danielle Carlson, Vasudha Goel, Andrew Grande, Donald R. Nixdorf, Sarah Benish, Alik S. Widge, Ziad Nahas, Michael C. Park, Tay I. Netoff, Alexander B. Herman, David P. Darrow, 2022. Personalizing Dual-Target Cortical Stimulation with Bayesian Parameter Optimization Successfully Treats Central Post-Stroke Pain: A Case Report (*Brain Sciences*)
- **Evan M. Dastin-van Rijn**, Nicole R. Provenza, Matthew T. Harrison, David A. Borton, 2021. How do packet losses affect measures of averaged neural signals? (*EMBC 2021*)
- Nicole R. Provenza, Sameer A. Sheth, **Evan M. Dastin-van Rijn**, Raissa K. Mathura, Yaohan Ding, Gregory S. Vogt, Michelle Avendano-Ortega, Nithya Ramakrishnan, Noam Peled, Luiz Fernando Fracassi Gelin, David Xing, Laszlo A. Jeni, Itir Onal Ertugrul, Adriel Barrios-Anderson, Evan Matteson, Andrew D. Wiese, Junqian Xu, Ashwin Viswanathan, Kelly R. Bijanki, Eric A. Storch, Jeffrey F. Cohn, Wayne K. Goodman, David A. Borton., 2021. Long-term ecological assessment of intracranial electrophysiology synchronized to behavioral markers in obsessive-compulsive disorder (*Nature Medicine*)
- **Evan M. Dastin-van Rijn**[†], Nicole R. Provenza[†], Jonathan S. Calvert, Ro'ee Gilron, Anusha B. Allawala, Radu Darie, Sohail Syed, Evan Matteson, Gregory S. Vogt, Michelle Avendano-Ortega, Ana C. Vasquez, Nithya Ramakrishnan, Denise N. Oswalt, Kelly R. Bijanki, Robert Wilt, Philip A. Starr, Sameer A. Sheth, Wayne K. Goodman, Matthew T. Harrison, David A. Borton. Uncovering biomarkers during therapeutic neuromodulation with PARRM: Period-based Artifact Reconstruction

and Removal Method (*Cell Reports Methods*)

- Nicole R. Provenza, Luiz Fernando Fracassi Gelin, Wasita Mahaphanit, Mary C. McGrath, **Evan M. Dastin-van Rijn**, Yunshu Fan, Rashi Dhar, Michael J. Frank, Maria I. Restrepo, Wayne K. Goodman, David A. Borton., 2021. Honeycomb: a template for reproducible psychophysiological tasks for clinic, laboratory, and home use. (*Brazilian Journal of Psychiatry*)

Conferences and Poster Presentations

9th Annual BRAIN Initiative Investigators Meeting	June 2023
“Electrical stimulation of mid striatum enhances cognitive control” (Presenter)	
9th Annual BRAIN Initiative Investigators Meeting	June 2023
“An Optogenetic Model of Mid-Striatal Electrical Deep Brain Stimulation to Improve Cognitive Flexibility” (Co-author)	
9th Annual BRAIN Initiative Investigators Meeting	June 2023
“Low-frequency power in the ventral capsule/ventral striatum and orbitofrontal cortex: a neural biomarker of obsessive-compulsive symptom provocation” (Co-author)	
Society of Biological Psychiatry Annual Meeting 2023	April 2023
“Deep Brain Stimulation in Rats Performing a Multi-Armed Bandit” (Co-author)	
Society of Biological Psychiatry Annual Meeting 2023	April 2023
“Deep Brain Stimulation Does Not Affect Impulsivity in a Rodent 5-Choice Serial Reaction Time Task” (Co-author)	
Society of Biological Psychiatry Annual Meeting 2023	April 2023
“Optogenetic Deep Brain Stimulation of mPFC Axons in Mid-Striatum Improves Cognitive Flexibility” (Co-author)	
Society of Biological Psychiatry Annual Meeting 2023	April 2023
“Deep Brain Stimulation Improves Reaction Times in an Assay of Cognitive Flexibility Through a Confluence of Features” (Presenter)	
Society of Biological Psychiatry Annual Meeting 2023	April 2023
“Chronic Ecological Assessment of Intracranial Neural Activity Synchronized to Disease-Relevant Behaviors in Obsessive-Compulsive Disorder” (Co-author)	
Society of Biological Psychiatry Annual Meeting 2023	April 2023
“Identification of candidate neural biomarkers of obsessive-compulsive symptom intensity and response to deep brain stimulation” (Co-author)	
Minnesota Neuromodulation Symposium 2023	April 2023
“An optogenetic model of mid-striatal electrical deep brain stimulation to improve cognitive flexibility” (Co-author)	
Minnesota Neuromodulation Symposium 2023	April 2023
“Prefrontal Cortex and Amygdala Interactions during Platform Mediated Avoidance: Insights from Neural Synchrony” (Co-author)	
Minnesota Neuromodulation Symposium 2023	April 2023
“Investigating Effects of Repetitive Mild Traumatic Brain Injury (rmTBI) on Maladaptive Avoidance Behavior” (Co-author)	
Minnesota Neuromodulation Symposium 2023	April 2023
“Deep brain stimulation does not affect impulsivity in a rodent 5-choice serial reaction time task” (Co-author)	
Minnesota Neuromodulation Symposium 2023	April 2023
“Deep Brain Stimulation in Rats Performing a Multi-Armed Bandit” (Co-author)	
Minnesota Neuromodulation Symposium 2023	April 2023
“Electrical stimulation of mid-striatum enhances cognitive control” (Presenter)	
Society for Neuroscience Annual Meeting 2022	November 2022

- “Identification of candidate neural biomarkers of obsessive-compulsive symptom intensity and response to deep brain stimulation” (Co-author)
Society for Neuroscience Annual Meeting 2022 November 2022
- “Early experiences with Percept: LFP changes in two patients receiving VC/VS DBS for OCD” (Co-author)
Society for Neuroscience Annual Meeting 2022 November 2022
- “Neurophysiology of the prefrontal-striatal circuitry during extradimensional Set-shifting in rats” (Co-author)
Society for Neuroscience Annual Meeting 2022 November 2022
- “Effects of Striatal DBS on the Trial-Irrelevant Activity in the Extradimensional Set Shifting Task” (Co-author)
Society for Neuroscience Annual Meeting 2022 November 2022
- “DBS disrupts reinforcement-based decision making in rats” (Co-author)
Society for Neuroscience Annual Meeting 2022 November 2022
- “Rodents Solve an Extradimensional Set-Shifting Task by Forgetful Adaptive Reinforcement Learning” (Presenter)
8th Annual BRAIN Initiative Investigators Meeting June 2022
- “Rodents Solve an Extradimensional Set-Shifting Task by Forgetful Adaptive Reinforcement Learning” (Presenter)
Society of Biological Psychiatry Annual Meeting 2022 April 2022
- “Characterizing Effects of Ventral Striatum Deep Brain Stimulation in Obsessive-Compulsive Disorder with Resting Magnetoencephalography” (Co-author)
Society of Biological Psychiatry Annual Meeting 2022 April 2022
- “Unilateral electrical stimulation is sufficient to improve behavioral flexibility in rodents” (Co-author)
Society of Biological Psychiatry Annual Meeting 2022 April 2022
- “Rodents Solve an Extradimensional Set-Shifting Task by Forgetful Adaptive Reinforcement Learning” (Presenter)
Minnesota Neuromodulation Symposium 2022 April 2022
- “Rodents Solve an Extradimensional Set-Shifting Task by Forgetful Adaptive Reinforcement Learning” (Presenter)
Minnesota Neuromodulation Symposium 2022 April 2022
- “Deep Brain Stimulation of the Mid-Striatum Impairs Probabilistic Reinforcement Learning in Rodents” (Co-author)
Minnesota Neuromodulation Symposium 2022 April 2022
- “Effects of deep brain stimulation in the mid-striatum on compulsive behavior in an extradimensional set-shifting task” (Co-author)
Minnesota Neuromodulation Symposium 2022 April 2022
- “Unilateral electrical stimulation is sufficient to improve behavioral flexibility in rodents” (Co-author)
Society for Neuroscience Annual Meeting 2021 November 2021
- “Effects of deep brain stimulation treatment for refractory obsessive-compulsive disorder on ventral striatal field potentials” (Co-author)
43rd Annual EMBC October 2021
- “How do packet losses affect measures of averaged neural signals?” (Presenter)
7th Annual BRAIN Initiative Investigators Meeting June 2021
- “Long-term ecological assessment of intracranial electrophysiology synchronized to behavioral markers in Obsessive-Compulsive Disorder” (Co-author)
2021 Northeast Bioengineering Conference March 2021
- “An adhesive sensor for measuring maternal sleeping position” (Presenter)
18th Society for Neuroeconomics Annual Meeting October 2020
- “Investigating individual differences in latent structure learning in a changing environment” (Presenter)
6th Annual BRAIN Initiative Investigators Meeting June 2020

“A novel method for DBS artifact removal: Period-based Artifact Reconstruction and Removal Method for DBS” (Presenter)

6th Annual BRAIN Initiative Investigators Meeting June 2020

“Chronic VC/VS DBS for OCD modulates VC/VS spectral power during rest” (Co-author)

2019 UTRA Summer Research Symposium August 2019

“Artifact removal from Local Field Potential recordings during Deep Brain Stimulation” (Presenter)

5th Annual BRAIN Initiative Investigators Meeting June 2019

“Preliminary experience with developing adaptive Deep Brain Stimulation for Obsessive Compulsive Disorder” (Co-author)

Teaching Experience

Head Teaching Assistant, Brown University 05/2021-07/2021

Was responsible for managing problem sets, design projects, exam questions, office hours, review sessions, and guiding other TAs for Dynamics and Vibrations

Teaching Assistant, Brown University 11/2020-04/2021

Was responsible for designing problem set style homework assignments, guiding student progress, and assisting with extended, open-ended final projects for Neural Computation in Learning and Decision Making

Teaching Assistant, Brown University 11/2020-04/2021

Was responsible for managing homework, lab assignments, exams, office hours, and review sessions for Transport and Biotransport Processes

Teaching Assistant, Brown University 01/2020-05/2020

Instructed students in three, week-long, MATLAB-based, design projects for Dynamics and Vibrations and held office hours to assist in debugging project code and writing reports

Meiklejohn Peer Advisor, Brown University 08/2019-05/2020

Advised a cohort of nine first-year, engineering students on adjusting to classes and lifestyle in a university setting

Classroom Assistant, STEMS 08/2018-05/2019

Assisted teachers with lessons in the classroom for high-school students in Algebra I, Geometry, and Algebra II at Hope High School in Providence

Mentor, PAL 08/2018-05/2019

Mentored two adults with learning disabilities (Stephie and Anthony) on topics of their choosing ranging from Jewish culture to driver's education

Awards

Trainee Highlight Award Honorable Mention (BRAIN) June 2023

Trainee Professional Development Award (SFN) September 2022

Cirtec Medical Poster Award Minnesota Neuromodulation Symposium (\$300) April 2022

Outstanding Biomedical Engineering Senior Award April 2021

NSF Graduate Research Fellowship March 2021

Biomedical Engineering Graduate Merit Award March 2021

Sigma Xi Honor Society March 2021

Tau Beta Pi Honor Society November 2019

Undergraduate Teaching and Research Award May 2018

American Foreign Service Association Academic Merit Award August 2017