Evan Dastin-van Rijn

dasti006@umn.edu 401-787-8534

Education

University of Minnesota-Twin Cities — **Minneapolis, MN**
PhD in Biomedical Engineering, Translational Neuroengineering Lab — Fall 2021-Present

Brown University — **Providence, RI**
Bachelor of Science in Biomedical Engineering and Neuroscience — Fall 2017-Spring 2021
Magna cum laude, Honors in Biomedical Engineering
Cumulative GPA 4.0/4.0

St. John's International School — **Waterloo, Belgium**
43 points in the IB Diploma (HL: Chemistry, Math, Physics, Philosophy) — 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 and assessed new methods for optimizing highly noisy, multidimensional problems using Bayesian Optimization
- 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
- Developed designs for new stimulation and recording electrodes for use in freely moving rodents

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, Inkscape
Lab: Electroencephalography, electrocardiography, circuit/PCB design, rat handling, rat surgery, task shaping, evoked response potentials

Publications

- **Evan M. Dastin-van Rijn**, Megan E. Mensinger, Alik S. Widge. 2025. DBS in Psychiatric Disorders. *(submitted book chapter for the Neuroscience of Deep Brain Stimulation)*

- Adriano E. Reimer†, **Evan M. Dastin-van Rijn**†, Jaejoong Kim, Megan E. Mensinger, Elizabeth M. Sachse, Aaron Wald, Eric Hoskins, Kartikeya Singh, Abigail Alpers, Dawson Cooper, Meng-Chen Lo, Amanda Ribeiro de Oliveira, Gregory Simandl, Nathaniel Stephenson, Alik S. Widge. 2024. Cross-species modeling and enhancement of cognitive control with striatal brain stimulation. *(Science Translational Medicine)*

- **Evan M. Dastin-van Rijn,** Joel Nielsen, Elizabeth M. Sachse, Christina Li, Megan E. Mensinger, Stefanie G. Simpson, Michelle C. Buccini, Francesca A. Iacobucci, David J. Titus, Alik S. Widge. 2024. Pybehave: a hardware agnostic, Python-based framework for controlling behavioral neuroscience experiments. *(Journal of Open-Source Software)*

- Heather J. Breidenbach, Virginia Woods, Uisub Shin, **Evan Dastin-van Rijn**, Mahsa Shoaran, Alik S. Widge. 2024. Method for Synthetic Generation of LFP Data for Testing of Feature Extraction Algorithms. *(EMBC 2024)*

- **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. 2021. 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

Society for Neuroscience Annual Meeting 2024 October 2024
"Enhanced cognitive flexibility in female mice in a novel touchscreen set shift task" (Co-author)
Society for Neuroscience Annual Meeting 2024 October 2024
"Optogenetic deep brain stimulation of medial PFC projections in mid-striatum improves cognitive flexibility" (Co-author)
Computational Psychiatry Conference 2024 July 2024
"Sex differences in mouse cognitive flexibility and decision making" (Co-author)
2024 American Society for Stereotactic and Functional Neurosurgery June 2024
"The effect of adaptive deep brain stimulation for obsessive-compulsive disorder in cognitive self-control under uncertainty" (Co-author)
Minnesota Neuromodulation Symposium 2024 April 2024
"Deep brain stimulation and inter-trial behaviors in a rodent 5-choice serial reaction time task (Co-author)
Minnesota Neuromodulation Symposium 2024 April 2024
"Dual-site neurostimulation in cortico-striatal circuitry in treatment-resistant obsessive compulsive disorder" (Co-author)
Minnesota Neuromodulation Symposium 2024 April 2024

"Optogenetic deep brain stimulation of mPFC projections in mid-striatum improves cognitive flexibility" (Co-author)
Minnesota Neuromodulation Symposium 2024 April 2024
"Sex differences and similarities in mouse cognitive flexibility" (Co-author)
Minnesota Neuromodulation Symposium 2024 April 2024
"Effect of Mid-Striatal Stimulation and Number of Trials Since Change in Stimulation on the Reaction Times of Rats Performing Set-Shifting Task" (Co-author)
Minnesota Neuromodulation Symposium 2024 April 2024
"Method for Synthetic Generation of LFP Data for Testing of Feature Extraction Algorithms" (Co-author)
2024 American Society for Stereotactic and Functional Neurosurgery June 2024
"Low-frequency power in the ventral capsule/ventral striatum and orbitofrontal cortex: a neural biomarker of obsessive-compulsive symptom severity" (Co-author)
Minnesota Neuromodulation Symposium 2024 April 2024
"Optimizing cognitive control with electrical stimulation" (Presenter)
Society for Neuroscience Annual Meeting 2023 November 2023
"Unilateral mid-striatal deep brain stimulation improves cognitive flexibility in rats" (Co-author)
Society for Neuroscience Annual Meeting 2023 November 2023
"Unraveling the mechanistic link between repetitive mild traumatic brain injuries and maladaptive avoidance: Insights from neural synchrony" (Co-author)
Society for Neuroscience Annual Meeting 2023 November 2023
"Deep brain stimulation does not affect impulsivity but increases inter-trial behaviors in a rodent 5-choice serial reaction time task" (Co-author)
Society for Neuroscience Annual Meeting 2023 November 2023
"Low-frequency power in ventral capsule/ventral striatum and orbitofrontal cortex: a neural biomarker of obsessive-compulsive symptom severity" (Co-author)
Society for Neuroscience Annual Meeting 2023 November 2023
"Black-box optimization of cognitive control with electrical stimulation" (Presenter)
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

Teaching Assistant, University of Minnesota 08/2024-12/2024
Was responsible for grading problem sets and fielding course questions as the only TA for a 75 student special topics class focused on analysis methods for biomedical data

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

GWBME Service Award	March 2024
MnDRIVE Data Science Initiative Fellowship	December 2023
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