Ariel K. Feldman

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EDUCATION

CARNEGIE MELLON UNIVERSITY, Pittsburgh, PA, USA 2020-Present
Ph.D. Candidate in Neural Computation

RICE UNIVERSITY, Houston, TX, USA 2016-2020
B.A. in Computer Science
B.A. in Cognitive Sciences
Minor in Neuroscience

RESEARCH EXPERIENCE

CARNEGIE MELLON UNIVERSITY, Pittsburgh, PA, USA 2020-Present
Advisor: Douglas J. Weber

- Leading a study with Synchron on proprioception in the human central and peripheral nervous systems, demonstrating how haptic feedback improves motor control and facilitates brain-computer interface control for patients with paralysis.
- Collaborating with Synchron to assess and enhance signal quality on the Stentrode through applied machine learning techniques such as Independent Component Analysis and regression in their US clinical trial.
- Initiated a collaboration with Allegheny Health Network's epilepsy unit to investigate multi-region information transfer.
- Co-designed transnasal brain stimulation technology for patients with disorders of the reward system, leading to a patent submission.
- Applied information theory to analyze grid cell encoding, demonstrating the utility of distributed source coding techniques for neural signal interpretation.

RICE UNIVERSITY, Houston, TX, USA 2016-2020
Advisors: Caleb Kemere & Jacob T. Robinson

- Fabricated micro-drive arrays, performed implants and designed experiments to study rodent localization & learning via hippocampal recording and stimulation.
- Built algorithms to predict when a sharp-wave ripple complex would occur to reduce stimulation latency.
- Designed and implemented motion tracking analyses to validate behavioral effects of a novel neural stimulation device, contributing to a publication in *Neuron*.

CORNELL UNIVERSITY, Ithaca, NY, USA 2019
Advisors: Mert Sabuncu & Jesse Goldberg

- Developed a pipeline to capture and analyze markerless motion data of budgerigars for behavior identification during interactions.

PROFESSIONAL EXPERIENCE

META REALITY LABS, Burlingame, CA, USA 2025
Research Scientist Intern for Neuromotor Control

- Investigating the relationship between the quality of human movement and underlying physiological signals.
- Designing and conducting experiments exploring human motor control, with a focus on capturing ecologically valid paradigms to develop robust and generalizable decoding models.

AWARDS

Henry L. Hillman Presidential Fellowship	2023
Carnegie Prize in Mind & Brain Sciences PhD Fellowship	2021
R.K. Mellon Presidential Fellowship	2020
Cornell NeuroNex REU Fellow	2019
Rice Undergraduate Research Scholars Program	2018

PEER-REVIEWED PUBLICATIONS

IN PREPARATION

1. **Ariel K. Feldman**, Kriti Kacker, Lois Yun, Nikole Chetty, James Bennett, Peter E. Yoo, David Lacomis, Noam Y. Harel, Raul G. Nogueira, Nicholas L. Opie, Jennifer L. Collinger, Thomas J. Oxley, David F. Putrino, Douglas J. Weber, "Preserving motor features by alternative re-referencing to remove heart artifact on the Stentrode".
2. Amanda Merkley, **Ariel K. Feldman**, Dorian M. Kusyk, Alex C. Whiting, Pulkit Grover, "Characterizing high-order interactions during conflict processing in patients with epilepsy".

PUBLISHED

1. Kriti Kacker, Nikole Chetty, **Ariel K. Feldman**, James Bennett, Peter E. Yoo, David Lacomis, Noam Y. Harel, Raul G. Nogueira, Shahram Majidi, Nicholas L. Opie, Jennifer L. Collinger, Thomas J. Oxley, David F. Putrino, Douglas J. Weber, "Motor activity in gamma and high gamma bands recorded with a Stentrode from the human motor cortex in two people with ALS". *Journal of Neural Engineering*, **2025**.
2. **Ariel K. Feldman**, Praveen Venkatesh, Douglas J. Weber, Pulkit Grover, "Information-theoretic tools to understand distributed source coding in neuroscience". Special Issue on "Data, Physics, and Life Through the Lens of Information Theory", *IEEE Journal on Selected Areas in Information Theory*, **2024**.
3. Amanda Singer, Shayok Dutta, Eric Lewis, Ziying Chen, Joshua C. Chen, Nishant Verma, Benjamin Avants, **Ariel K. Feldman**, John O'Malley, Michael Beierlein, Caleb Kemere, Jacob T. Robinson, "Magnetoelectric materials for miniature, wireless neural stimulation at therapeutic frequencies". *Neuron*, **2020**.

PATENTS

PENDING

1. Mats Forssell, Pulkit Grover, Chaitanya Goswami, Boyle Cheng, Yuxin Gao, Yuhyun Lee, Vishal Jain, **Ariel K. Feldman**, Neil Mehta, "Method for Non-Invasive or Minimally-Invasive Stimulation of Deep Brain Targets", **2024**.

PODIUM PRESENTATIONS

1. **Ariel K. Feldman**, Praveen Venkatesh, Douglas J. Weber, Pulkit Grover, "An Information Theoretic Analysis of Grid Cells", *Rice Neuroengineering Initiative Conference,* Houston, TX, USA, May **2022**.
2. **Ariel K. Feldman**, Eugene Kim, Mert Sabuncu, Jesse Goldberg, "Building a Basis for Budgie Behavior", *Cornell NeuroNex*, Ithaca, NY, USA, August **2019**.
3. **Ariel K. Feldman**, Shayok Dutta, Etienne R. Ackermann, Caleb Kemere, "Development of the RELevator for exploring 3 Dimensional spatial representations of rodent hippocampal place cells", *Gulf Coast Undergraduate Research Symposium*, Houston, TX, USA, November **2017**.

POSTER PRESENTATIONS

1. **Ariel K. Feldman**, Lois Yun, Kriti Kacker, Nikole Chetty, James Bennett, Peter E. Yoo, Noam Y. Harel, Jennifer Collinger, Nicholas L. Opie, David Lacomis, Thomas J. Oxley, David F. Putrino and Douglas J. Weber, "A comparative analysis of spatial filtering techniques on a Stentrode", *Society for Neuroscience*, Chicago, IL, USA, October **2024**
2. Amanda Merkley, **Ariel K. Feldman**, Dorian M. Kusyk, Alexander C. Whiting and Pulkit Grover, "Characterizing high-order interactions during conflict processing in patients with epilepsy", *Society for Neuroscience*, Chicago, IL, USA, October **2024**.
3. **Ariel K. Feldman**, Kriti Kacker, Lois Yun, Nikole Chetty, James Bennet, Peter E. Yoo, Noam Y. Harel, Jennifer L. Collinger, Nicholas L. Opie, David Lacomis, Thomas J. Oxley, David F. Putrino and Douglas J. Weber, "Preserving motor related features across frequency bands through spatial filtering on the Stentrode", *NSF BRAIN IUCRC,* West Virginia University, Morgantown, WV, USA, August **2024**.
4. **Ariel K. Feldman**, Nikhil Verma, Marc Powell, Erynn Sorensen, Erick Carranza, Luigi Borda, George F. Wittenberg, Elvira Pirondini, Marco Capogrosso, Pulkit Grover and Douglas J. Weber, "Towards closed loop spinal cord stimulation for upper-limb motor control", Carnegie Mellon University, Pittsburgh, PA, USA, March **2023**.
5. **Ariel K. Feldman**, Praveen Venkatesh, Douglas J. Weber, Pulkit Grover, "A Partial Information Decomposition Analysis of grid cell encoding", *Society for Neuroscience*, San Diego, CA, USA, November **2022**.
6. Shayok Dutta, **Ariel K. Feldman**, and Caleb T. Kemere, "Selective Disruption of Hippocampal Sharp-Wave Ripples Leads to Impaired Object-Place Recognition Memory". *Society for Neuroscience*. Chicago, IL, USA, October **2019**.
7. Shayok Dutta, **Ariel K. Feldman**, and Caleb T. Kemere, "Selective Disruption of Hippocampal Sharp-Wave Ripples Leads to Impaired Object-Place Recognition Memory". *UT Austin Conference on Learning and Memory*. Austin, TX, USA, April **2019**.
8. **Ariel K. Feldman**, Shayok Dutta, and Caleb T. Kemere, "A Machine Learning Approach to Predicting Occurrence of Sharp-Wave Ripple Complexes". *Rice Undergraduate Research Symposium*. Houston, TX, USA, April **2019**.

OTHER PUBLIC SPEAKING

- **Ariel K. Feldman**, "Hand, Foot and Mind", *TEDx: RiceU*, Houston, TX, USA, May **2017**.

TEACHING EXPERIENCE

GRADUATE TEACHING

CARNEGIE MELLON UNIVERSITY, Pittsburgh, PA, USA
Teaching Assistant, Fall 2022

- Neural Engineering Laboratory course (42-783)
- Graded homework assignments.
- Provided in-lab hardware & software technical support for students.

UNDERGRADUATE TEACHING

RICE UNIVERSITY, Pittsburgh, PA, USA
Academic Fellow, Mar. 2018 – May 2020

- Selected on behalf of the Rice University Office of Academic Advising based on proven academic achievement and demonstrated willingness to help fellow students.
- Offered on-call aid in Computer Science, Neuroscience and paper writing (historical/STEM research) through weekly office hours, one-on-one tutoring, review sessions for classes in my fields, and planned academic outreach events to engage students.

Laboratory Assistant, Spring 2020

- Fundamentals of Computer Engineering course (ELEC 220)
- Assisted Professor in the Practice Ray Simar in conducting labs and transferring content online via Zoom during the COVID-19 Pandemic.
- Regarded by Rice University as an example for other courses involving computational and hardware components to move online in the future.

Teaching Assistant, Fall 2019

- Computational Thinking course (COMP 140)
- Led review sessions, created exam review material, graded exams and projects, and held weekly office hours to assist students in mastery of material.

Teaching Assistant, Fall 2018

- Fundamentals of Cellular and Molecular Neuroscience course (NEUR 385/585)
- Led review sessions, created exam review material, and held weekly office hours to assist students in mastery of material.

ADDITIONAL TEACHING

RICE UNIVERSITY, Houston, TX, USA
Laboratory Assistant, Spring 2021

- Fundamentals of Computer Engineering course (ELEC 220)
- After graduating from Rice, I was asked to return virtually to assist in running this course, and train new laboratory assistants on conducting hybrid-style hardware-based courses.

COURSE DEVELOPMENT

MantisEDU, New Orleans, LA, USA
Course Instructor, Winter 2021

- Partnered with MantisEDU to make a nationally available course for middle & high school students who are underserved by their local educational resources.

RICE UNIVERSITY, Houston, TX, USA
Course Instructor, Summer 2020

- Created "Internet of Things (IOT) with Machine Learning and Python" as a week-long course for Rice Center for Engineering Leadership's ELITE Tech Camp.
- Managed a team of undergraduate students and coordinated with an industry partner for hardware.
- Taught two cohorts of middle and high school aged students per week throughout the summer.

STUDENT MENTORSHIP

CARNEGIE MELLON UNIVERSITY, Pittsburgh, PA, USA

- Marissa Todesco
- Sheldon-Anthony Amofah
- Lois Yun
- Shruthi Sudheendra
- Leo Hasher
- Miguel Martinez

RICE UNIVERSITY, Houston, TX, USA

- Elisabeth Torres-Schulte

LEADERSHIP

Carnegie Mellon Neuroscience Institute Student Organization, Pittsburgh, PA
Vice President of Finance, 2021-2022

- Proposed and managed budgets with the administration.
- Planned events for graduate students in the Neuroscience Institute.

Rice Neuroscience Society, Houston, TX
Internal Vice President, 2018-2019

- Coordinated campus-wide events to engage students in neuroscience.
- Planned outreach events, including the Brain Bee, for the Houston community to engage with neuroscience.

REVIEWER SERVICE

JOURNAL REFEREEING – AD HOC REVIEWER

- Reviewer, ***Journal of Neural Engineering***, 2025 (n=2)

SKILLS

PROGRAMMING LANGUAGES: Python, C/C++, Java, MATLAB, R
TECHNICAL SKILLS: Arduino, Raspberry Pi, EAI Tactors, micro-drive array fabrication
SOFT SKILLS: Mentorship, public speaking, technical writing
RESEARCH & DEVELOPMENT SKILLS: Clinical research collaboration, neural signal processing, experimental neuroscience, electrophysiology, rodent neurosurgery