

# ARIEL FELDMAN

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## OBJECTIVE

Neuroengineer with extensive experience designing and characterizing novel neural interfaces.

## EDUCATION

### Carnegie Mellon University

Expected May 2025

*Ph.D. Candidate in Neural Computation*

### Rice University

2020

*B.A. in Computer Science & Cognitive Sciences (Neuroscience minor)*

## SKILLS

**Programming Languages:** *Advanced* - Python; *Intermediate* - MATLAB, Java, C, R

**Analysis:** Time series analysis, spatial filtering, dimensionality reduction, partial information decomposition

**Tools:** Git, Jupyter, MNE, VSCode, Arduino, EAI Tactors, NumPy, SciPy

## RESEARCH EXPERIENCE

### Carnegie Mellon University, Graduate Researcher with Douglas J. Weber

Aug. 2020 - Present

- 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.
- Spearheaded 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, Undergraduate Researcher with Caleb Kemere & Jacob T. Robinson

Jan. 2017 - Jan. 2020

- Fabricated micro-drive arrays for hippocampal stimulation experiments to study sharp-wave ripple complexes.
- Applied AdaBoost and cascade learning 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*.

## SELECTED TEACHING

- Fundamentals of Computer Engineering (ELEC 220)
- Computational Thinking (COMP 140)
- Fundamentals of Cellular and Molecular Neuroscience (NEUR 385/585)

## SELECTED PUBLICATIONS

- K. Kacker, N. Chetty, **AK. Feldman** et al. "Spectral features of endovascular ECoG signals recorded from a Stentrode in the human motor cortex". *Journal of Neural Engineering*, **2025**. doi: 10.1088/1741-2552/adbd78
- **AK. Feldman** et al. "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**. doi: 10.1109/JSAIT.2024.3409683
- A. Singer, ..., **AK. Feldman** et al. "Magnetoelectric materials for miniature, wireless neural stimulation at therapeutic frequencies". *Neuron*, **2020**. doi: 10.1016/j.neuron.2020.05.019

## PATENTS

- M. Forssell, ..., **AK. Feldman** et al. "Method for Non-Invasive or Minimally-Invasive Stimulation of Deep Brain Targets", Application number 18/742524 [pending].

## 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).