

DONELSON GRAHAM BERGER

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Education

University of Wisconsin Madison

Bachelor of Science in Computer Science

September 2018 – Anticipated December 2021

Madison, WI

Experience

Banks Lab, Department of Anesthesiology

March 2020 – Present

Undergraduate Researcher

Madison, WI

- Created Markov models of functional magnetic resonance imaging (fMRI) and intracranial electrophysiological (iEEG) time series data
- Got functional clusterings, based off network flow of iEEG Markov models using the InfoMap algorithm
- Used Diffusion Map Embedding, a non-linear dimensionality reduction technique, to calculate the similarity between fMRI and iEEG Markov models and how non-random sampling in iEEG data affects its description of the brain
- Engineered a pipeline that handles over 40 patients and 300 GBs of fMRI and iEEG data from preprocessing to a Dash webapp, which visualizes data in real time

Capital One

June 2021 – August 2021

Software Engineer Intern

McLean, VA

- Worked in Card Tech-Machine Learning, optimizing the runtime of the gradient boost model, which generates over a billion dollars annually, that determines likelihood that a customer will pay back their credit card debt after six months of delinquency
- Utilized Helm, Docker and Kubernetes to deploy test models for runtime analysis
- Used AWS S3 Buckets, Snowflake and Spark in combination to feed customer data into test models

AtomBeam Technologies

July 2019 – January 2020

Software Engineer Intern

Moraga, CA

- Used Python and the Boto3 SDK to develop scripts to automate the testing of the AtomBeam's IP on AWS
- Reviewed core code written in C that is used to develop the AtomBeam IP
- Performed algorithmic analysis and review on mathematical white papers

Publications and Presentations

Paper Perwrite: Matthew I. Banks, Bryan M. Krause, **D. Graham Berger**, et al. "Functional geometry of auditory cortical resting state networks derived from intracranial electrophysiology"

Conference Poster: **D. Graham Berger**, et al. "Comparison of functional geometry of cortical networks derived from functional magnetic resonance imaging (fMRI) versus intracranial electroencephalography (iEEG)", SFN 2021

Conference Poster: Matthew I. Banks, Bryan M. Krause, **D. Graham Berger**, et al. "Functional geometry of cortical resting state networks derived from intracranial electrophysiology", SFN 2021

Conference Poster: Declan Campbell, Bryan M. Krause, **D. Graham Berger**, et al. "Graph theoretic measures indexing arousal state transitions during sleep and anesthesia in human subjects", SFN 2021

Projects

Self Driving Remote Control Car

July 2020 - Present

- Built a computer operated RC car with a Jeston Nano and Donkey Car software
- Used supervised learning based on human driving to auto driving
- Currently utilizing Unity to create a self-driving policy with reinforcement learning

Lunar Lander Reinforcement Learning

June 2021

- Implemented Actor-Critic reinforcement learning method to solve LunarLander-v2 environment in OpenAI gym
- Used batch learning with a memory through PyTorch

Awards

Hilldale Research Fellowship | *[My proposal](#)*

April 2021

IOHK: Plutus Pioneer Program Certification

July 2021

Eagle Scout Award

May 2016