

# 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
- Acquired 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 effects 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 a gradient boost model, which generates over a billion dollars annually and determines the 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 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 Prewrite:** 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 input to auto driving
- Currently, utilizing Unity to create a self-driving policy with reinforcement learning

**Lunar Lander Reinforcement Learning**

**June 2021**

- Implemented Actor-Critic, a 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**