Donelson Graham Berger

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Education

University of Wisconsin Madison **September 2018 – Anticipated December 2021**
Bachelor of Science in Computer Science *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 affects its description of the brain
- Engineered a pipeline that handles over 40 patients and 300 GBs of fMRI and iEEG data from prepossessing 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 in the development of AtomBeam's 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 micro-computer and Donkey Car software
- Used supervised learning based on human input to automate 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 memory through PyTorch

Awards

Hilldale Research Fellowship | ***My proposal*** **April 2021**

IOHK: Plutus Pioneer Program Certification **July 2021**

Eagle Scout Award **May 2016**