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Austin Barton

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EDUCATION

Georgia Institute of Technology Projected Graduation Date: May 2025 | Atlanta, GA

B.S. in Mathematics and Computer Science (GPA: 3.77)

Relevant Upper Coursework:

Natural Language Processing (Current); Stochastic Processes (Current); Robotics (Current); Deep Learning; Machine Learning; Statistical Theory; Math of Data Science; Database Systems; Information Theory; Artificial Intelligence; Probability Theory; Algorithm Analysis; Data Structures and Algorithms; Real Analysis

SKILLS

Programming Languages: *Highly Proficient* in Python. *Proficient* in SQL, Java, LaTeX, C. *Familiar* with Bash, MATLAB, R, C++.

Libraries, Frameworks, Etc.: PyTorch, Scikit-learn, NumPy, Pandas, Matplotlib, SciPy, Keras, Seaborn, Git.

Concepts: Deep Learning, Machine Learning, Natural Language Processing, Computer Vision, Statistics, Generative Models, Data Science, Data Processing, Databases, Data Structures, Algorithms, OOP/OOD, VCS, Agile Methodology.

RESEARCH EXPERIENCE

VERTICALLY INTEGRATED PROGRAM (VIP) | Student Researcher Atlanta, GA | January 2024

- Researching retrieval augmented and supervised fine-tuned large language models for knowledge intensive tasks under the context of financial data at Georgia Tech's Financial Services and Innovation Lab.

RESEARCH EXPERIENCE FOR UNDERGRADUATES | Researcher Raleigh, NC | May 2023 - Aug 2023

- Parameter estimation and modeling at the NSF and NSA sponsored research program (REU) hosted by NC State University. Used PINNs and equation learning to infer an approximate ODE for an agent-based model with adaptive behaviors. Presented this research at the 2024 Join Mathematics Meeting, 2023 Biomathematics Education and Ecology Research Symposium, and 2023 NC State Undergraduate Research Symposium.

WORK EXPERIENCE

UNITED STATES MARINE CORPS | Infantry Assaultman (E-5) Camp Lejeune, NC | Oct 2016 - Oct 2020

- Led, mentored, and collaborated with a team of 12 Marines to prioritize mission accomplishment under hazardous working conditions and stressful environments as part of Weapons Plt., Fox Co., 2/6 in support of riflemen for numerous training operations and two overseas deployments for a total of 15 months deployed.

PROJECTS

ANALYZING SSM AND ATTENTION RALMS CS 4650, Natural Language Understanding, Georgia Tech | Jan 2024 - Present
NLP course project on analyzing retrieval augmented language models (RALMs) with selective state space and attention based architectures for knowledge intensive tasks with large context retrieval.

SINGLE-SHOT HYPERSPECTRAL DEEP DECONVOLUTION CS 4644, Deep Learning, Georgia Tech | Aug 2023 - Dec 2023
Project on Single-shot Hyperspectral Deep Deconvolution. Aimed to enhance the quality of high resolution hyperspectral images by mitigating distortions inherent in snapshot acquisitions by leveraging blind deconvolution with a U-Net. Demonstrated models capable of restoring spectral information while restoring the latent sharp image.

EXPLORING MUSIC CLASSIFICATION CS 4641, Machine Learning, Georgia Tech | Aug 2023 - Dec 2023
Led a group project on music classification on two distinct datasets for two different classes - composers and genres. Created a framework in Python for audio data processing, dimensionality reduction, and supervised learning methods such as convolutional neural networks and gradient-boosted trees. Created a Jekyll-powered website for the project.

BIRD CLASSIFICATION WITH CNNS MATH 4210, Math of Data Science, Georgia Tech | Jan. 2023 - May 2023
Explored 3 distinct Convolutional Neural Network (CNN) models on a multi-class image classification task in Python using Keras. The dataset consisted of approximately 88,000 bird images belonging to 515 different classes/species.

SIMPLE RANDOM WALKS AND ENUMERATION MATH 3235, Probability Theory, Georgia Tech | Oct. 2022 - Dec. 2022
Wrote a paper surveying simple random walks under probabilistic and combinatorial perspectives.

ACTIVITIES

Directed Reading Program Studied enumerative combinatorics under the guidance of a postdoctoral researcher over Fall 2022.
Georgia Tech Cycling Club Recreational mountain biking and road cycling.

AWARDS

Academic Awards
John and Susan Traendly Scholar
Zell Miller Scholar
Dean's List

Notable Military Awards
Certificate of Commendation
Meritorious Promotion
Good Conduct Medal