

Braeden (Brady) Berg

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Education

Bachelor of Science, Computational Data Science
Michigan State University

September 2019 - December 2023
GPA: 3.98

Experience

Lead Machine Learning Engineer

August 2023- December 2023

Blueflite

- Led the creation of a novel machine learning model that integrates data-driven optimization with fundamental principles of physics to accurately predict a drone's center of gravity during flight.
- Established a propeller and motor test bench to collect data and characterize the efficiency and propulsion of drone components. This initiative provided valuable insights into the performance characteristics of different propeller and motor configurations.
- Collaborated closely with cross-functional teams to design and implement comprehensive visualizations and reports.
- Engaged in brainstorming sessions with engineers to blend domain expertise with data-driven methodologies, resulting in innovative solutions that leveraged the best of both worlds for improved drone performance and operational efficiency.

Lead Software Engineer

March 2022- December 2023

NASA-funded projects at Michigan State University (NASA USRC)

- Engineered advanced software enabling drones to autonomously land, latch, and charge on public transportation vehicles, enhancing operational efficiency and reducing the need for manual intervention.
- Spearheaded the development of a sophisticated flight planning algorithm, integrating live transit data to produce real-time, adaptive flight plans, ensuring timely and accurate drone deliveries.
- Led the design and implementation of a cutting-edge system for in-flight drone charging using high-powered lasers. Developed and optimized algorithms for precise drone tracking and dynamic flight motion control, significantly advancing the capabilities of autonomous drone operations.

Researcher

September 2023- February 2024

Research group on Human-AI Interaction, MSU

- Spearheaded research initiatives employing Large Language Models (LLMs) to delve into the nuances of human-AI interaction dynamics.
- Conceived and engineered a cutting-edge interactive application designed to meticulously capture, record, and analyze patterns in which individuals engage with LLMs.
- Expertly integrated Docker for container management, coupled with Azure cloud services, ensuring seamless deployment and scalability of the application in real-time environments.

Deep Learning Researcher - Capstone Project

January 2023- May 2023

Henry Ford Health Capstone Project

- Leveraged the UNET deep learning architecture to design, build, and train a state-of-the-art model focused on the segmentation of ultrasound images into distinct tissue types, improving diagnostic clarity and precision.
- Undertook meticulous data cleaning to process screen captures from various ultrasound machines, ensuring the consistent quality of input data, which played a critical role in enhancing model performance.
- Worked closely with medical professionals to understand the intricacies of ultrasound imaging, and incorporated feedback to refine the model, making it more adaptable and effective in real-world medical scenarios.

Data Science Intern

May 2022 – August 2023

Delta Dental (Roosevelt Innovations)

- Conducted innovative research into embedding system rules into vector representations, facilitating easier management of a complex decision management system.
- Utilized computer vision and natural language processing models to analyze document contents, enabling automated mapping of contractual policies.
- Developing Large Language Model (LLM) applications to interpret and generate logic in the language of the decision management system, streamlining system upgrades and modifications.

Researcher

May 2021 – May 2022

Michigan State University Civil and Environmental Engineering Department

- Devised an innovative method for generating synthetic residential appliance energy demand loads, significantly enhancing grid-wide residential demand response case study outcomes.
- Leveraged advanced time-series modeling, visualization, and numerical estimation techniques for effective data analysis and strategic planning.

Publications

- Berg et al. (2023). *Enhancing Knowledge Management in Healthcare....* The Int. FLAIRS Conf. Proceedings. [Link](#)
- Jahanbani et al. (2022). *2050 Power Grids: Control Through Demand*. IEEE PESGM. [Link](#)
- Berg et al. (2022). *Occupant-Driven End Use Load Models for Demand Response....* [Link](#)
- Berg et al. (2022). *Impact of the COVID-19 Pandemic on Single Family Homes' Electricity Consumption....* [Link](#)

Technical Skills

ML: PyTorch, TensorFlow, HuggingFace, Sklearn, H2O, ONNX, SHAP, Active Learning, Large Language Models, Fine Tuning, Deep Learning Architecture Design, OpenCV, Object Segmentation/Detection/Classification

Databases: MongoDB, MySQL, SQLite, Vector Search, Blob Storage

Optimization: Scipy, Pulp, Gurobi | **Languages:** Python, SQL, JS, Lua, C++, R | **Tools:** REST API, Docker, Azure