Bryan Zhao

860-328-9421 | bryanzhao@gatech.edu | linkedin.com/in/bryan-zhao | bzhao18.github.io
U.S. Citizen | Secret Level Security Clearance

Objective

Innovative computer science graduate student leveraging 1+ years of industry experience and strong technical abilities from 10+ projects. Seeking full-time positions related to ML/AI, robotics, and software development starting May 2024 or later.

Education

GEORGIA INSTITUTE OF TECHNOLOGY **Atlanta, GA**

***Master of Science in Computer Science**, Specialization in Machine Learning GPA: 4.00* *Expected May 2024*

- Courses: Algorithms, Convex Optimization, Parallel Algorithms, Databases, Deep Learning, Systems for Machine Learning

***Bachelor of Science in Mechanical Engineering**, Minor in Computer Science GPA: 3.98* *May 2022*

- Courses: Object Oriented Programming, Data Structures, Machine Learning, Artificial Intelligence, Computer Architecture, Circuits, Robot Perception & Planning, Robot Design & Dynamics, Interactive Robot Learning

Experience

MIT LINCOLN LABORATORY **Boston, MA**

***Research Intern** | Python, C/C++, ROS, Linux, GNN, CV, SLAM* *May 2023 – Present*

- Building PyTorch computer vision models to extract hierarchical graphs from satellite imagery, enabling robots to use MIT Hydra, a simultaneous localization and mapping (SLAM) algorithm, to navigate outdoors in search-and-rescue missions
- Developing robot operating system (ROS) Python packages for the Boston Dynamics Spot robot to search for objects autonomously outdoors using hierarchical graphs which will decrease computation costs to speed up real-time performance
- Led a group of 5 interns to build ROS software packages, interface sensors with an NVIDIA Jetson, and 3D print parts for the SpotMicro, an open-source version of the Spot robot by Boston Dynamics, for multi-robot experimentation

BMW GROUP **Greenville, SC**

***Machine Learning Intern** | Python, AWS, LLM* *May 2022 – Aug 2022*

- Built a Python pipeline in AWS to train OpenAI's 175B-parameter Large Language Model (LLM) called GPT-3 that automatically classifies business documents, saving $500k and achieving 98% accuracy (+30% versus existing methods)
- Created Python scripts with AWS Textract/Translate to extract text from 500+ German PDF documents for model training
- Developed the backend for Meta AI's LLM called OPT to be used on-premises, enabling processing of confidential data

RAYTHEON TECHNOLOGIES **East Hartford, CT**

***Research and Development Intern** | LabVIEW, UI/UX* *May 2021 – Aug 2021*

- Developed the user interface, state machine transition logic, and PID temperature control in LabVIEW for mechanically testing airplane engine parts, resulting in a system that operated autonomously for 500+ continuous hours
- Automated 3D modeling processes to generate CAD renders, reducing time spent on modeling by 80% from 10 to 2 weeks

ANDURIL **Atlanta, GA**

***Research and Development Intern** | Solidworks, Manufacturing* *Jan 2021 – May 2021*

- Engineered a new testing program for the next generation of drone and launcher systems to attain a 330% increase in launch energy, creating the Solidworks design, plan for manufacture and assembly, data collection system, and testing procedures
- Designed and managed a MS Access database to track customer requirements on a $1M+ government contract

Research

CORE ROBOTICS LABORATORY **Atlanta, GA**

***Graduate Research Assistant** | C++, ROS, Linux, CV* *Aug 2022 – May 2023*

- Published an IEEE conference paper with a team of 10+ students presenting development of a tennis-playing wheelchair robot used to better understand human-robot collaboration: core-robotics-lab.github.io/Wheelchair-Tennis-Robot
- Developed Robot Operating System (ROS) packages in C++ for camera systems to triangulate the position of tennis balls in real-time, resulting in 1.5X quality and 2X framerate of video data over existing systems to improve ball return rate to 50%
- Processed and visualized flight data and VICON camera data in Python to create a model-based controller for a quadcopter

GEORGIA TECH RESEARCH INSTITUTE **Atlanta, GA**

***Research and Development Intern** | Solidworks, Manufacturing* *July 2020 – Aug 2020*

- Contributed to a research paper analyzing bio-inspired, slip-resistant materials for gloves, robotic traction, shoe soles, etc. by generating mechanical software models in ANSYS simulating animal traction on wet surfaces
- Researched novel computational techniques to simulate 3 key behaviors to understand water evacuation under animal paws

EXOSKELETON & PROSTHETIC CONTROLS LABORATORY **Atlanta, GA**

Undergraduate Research Assistant | *Solidworks* *Jan 2019 – May 2019*

- Conducted trial investigations on a hip exoskeleton to troubleshoot stepper motor performance and perform study on timing of exoskeleton assistance during the user's walking gait on ramps and stairs of varying steepness at varying speeds
- Modeled exoskeleton parts to assist in the development of a 20% more compact design

NAVAL SUBMARINE MEDICAL RESEARCH LABORATORY **Groton, CT**

Research and Development Intern | *Solidworks, Rapid Prototyping* *May 2017 – Aug 2017*

- Prototyped a remote-controlled, Ø2ft X 6ft blimp contributing to research in a novel concept in lighter-than-air surveillance
- Developed a new method for manufacturing an air-tight blimp envelope from thick metalized polymer film

Projects

PARALLEL ALGORITHMS, *Project Lead* | *C/C++, MPI, PBS Scripting* *Jan 2023 – May 2023*
Implemented parallel quicksort and numerical linear solvers using C/C++ and MPI, deploying codebase on a 120-core computing cluster using PBS scripts to achieve a performance increase of up to 10X compared to sequential methods

AI FOR GOOD: DETECTING MULTIMODAL HATE, *Project Lead* | *Python, PyTorch* *Jan 2023 – May 2023*
Fine-tuned various vision-language models including OpenAI's CLIP to achieve 70% accuracy on the Hateful Memes Challenge, a dataset curated by Meta to promote research on multimodal content moderation: arxiv.org/abs/2305.06159

ATARI AI TRAINER, *Project Lead* | *Python, PyTorch, OpenAI Gym, CV, NLP, RL* *Aug 2022 – Dec 2022*
Created a framework to train an AI to play Atari video games using verbal directives, facial expressions, and numerical input

NASA JPL ROBOT SPACE SAMPLER, *Software & Hardware Lead* | *C, Arduino* *Aug 2021 – Dec 2021*
Developed the C-based Arduino controller for a space robot which will gather extraterrestrial liquid samples in search of life

MANUFACTURING DEFECT CLASSIFIER, *Undergraduate Research Assistant* | *Java* *Aug 2021 – Dec 2021*
Scripted an image classifier using Java in Weka to inspect and classify scans of metal 3D printed parts for porous defects

NHL PLAYOFF PREDICTOR, *Project Lead* | *Python, Tableau, Scikit-learn* *Aug 2021 – Dec 2021*
Processed and visualized data to train models that predict NHL playoff teams with over 80% accuracy using limited data

RED CROSS VEHICLE MANAGEMENT SYSTEM, *Project Lead* | *UI/UX, CRM* *Jan 2021 – May 2021*
Collaborated with Red Cross to digitize their paper-based vehicle reservation system to a completely online user portal

ELECTRIC FORMULA SAE, *Project Lead* | *Solidworks, Project Management* *Aug 2019 – May 2020*
Led a team of 5 to design a mount for dynamometer testing of the electric motor, contributing to data collection initiatives

Leadership

CS 7641 MACHINE LEARNING, *Head Teaching Assistant* | *Python, Project Management* *Jan 2022 – Present*
Managing a team of 30+ TAs to teach machine learning concepts to 700+ students/semester for 20 hours/week, primarily overseeing the creation, advisement, and evaluation of 200+ final projects related to machine learning using real-world datasets

Nominated for the College of Computing Teaching Assistant of the Year (1 in 30)

INVENTION STUDIO, *Instructor* | *Rapid Prototyping, Manufacturing* *Jan 2020 – May 2021*
Managed 3,000 ft^2 makerspace that accommodates 500+ students weekly during volunteer shifts of 3 hours/week

180 DEGREES CONSULTING, *Co-Founder* | *Project Management, UI/UX* *Jan 2020 – May 2021*
Co-Founded the Georgia Tech chapter of 180DC, the #1 largest international pro-bono student consultancy for nonprofits, and launched the creation, management, and promotion of the organization's webpage to garner 500+ monthly visitors

ME 3340 FLUID DYNAMICS, *Teaching Assistant* | *Modeling, Mathematics* *Aug 2020 – Dec 2020*
Created and applied grading rubrics for assignments on fluid mechanics to serve 50+ students for 3 hours/week

GEORGIA TECH EUROPE, *Resident Assistant* | *Management* *May 2019 – Aug 2019*
Supervised and ensured the safety of a 120+ student dorm during a study abroad program in Metz, France

Technical Skills

Languages: Python, C/C++, Java, HTML/CSS, MATLAB, SQL (MySQL), MPI, LaTeX
Developer Tools: Git, Conda, Docker, ROS, Tableau, VS Code, Jupyter/Colab, AWS, NVIDIA Jetson, Arduino, Linux, Windows
Libraries: PyTorch, OpenCV, Pandas, NumPy, Matplotlib, Plotly, Scikit-learn, NetworkX
Other: Agile, Jira, Kanban, Gantt Chart, Solidworks, KiCAD, Simulink, ANSYS