# ALEXI GLADSTONE

+1(571)643-3686 ◇ Charlottesville/Woodbridge, VA
alexi@virginia.edu ◇ LinkedIn ◇ GitHub ◇ Website

## EDUCATION

**University of Virginia (UVA), School of Engineering** **August 2020 - May 2024 (Expected)**
Bachelor of Science in Computer Science — 4.0 Cumulative GPA — Data Science Minor
• Admitted into Rodman Scholar Engineering Honor's program — top 3% of UVA engineering students

## PUBLICATIONS

- [Manuscript Preparation] **Alexi Gladstone**, Ganesh Nanduru, Mofijul Islam, Tariq Iqbal, Jundong Li. "Building World Models through Compatibility Estimation" **CVPR 2024 Computer Vision and Pattern Recognition**
- [Manuscript Preparation] **Alexi Gladstone**, Kshitij Bhatta, Zach Yahn, Autumn Routt, Tariq Iqbal. "How do noise level and task complexity affect communication modality effectiveness?"
- [Manuscript Preparation] Md Mofijul Islam, Ganesh Nanduru, **Alexi Gladstone**, Sujan Sarker, Keyan Du, Srikar Gouru, Tariq Iqbal."COBRA: Comprehending Embodied Referring Expressions from Multiple Perspectives Using Language and Visual Cues" **IEEE Transactions on Pattern Analysis and Machine Intelligence**
- [Manuscript Preparation] Md Mofijul Islam, **Alexi Gladstone**, Tao Groves, Tariq Iqbal, "SDD: A Shape Guided Diffusion Model for Generating Depth"
- [Under Review] Md Mofijul Islam, **Alexi Gladstone**, Riashat Islam, Tariq Iqbal."EQA-MX: Embodied Question Answering using Multimodal Human Expression" **ICLR 24 International Conference on Learning Representations**
- Md Mofijul Islam, **Alexi Gladstone**, Tariq Iqbal."PATRON: Perspective-aware Multitask Model for Referring Expression Grounding using Embodied Multimodal Cues." **AAAI 23 [Main Track Acceptance Rate 19.6%]**
- Md Mofijul Islam, Reza Manuel Mirzaiee, **Alexi Gladstone**, Haley N. Green, Tariq Iqbal. "CAESAR: An Embodied Simulator for Generating Multimodal Referring Expression Datasets." **NeurIPS 2022 (Track on Datasets and Benchmarks)**

## WORK HISTORY

**Research Assistant,** Professor Jundong Li's Research Lab @ UVA, Charlottesville, VA **March 2023 - Present**

- Leading project regarding a new approach to the creation of world models using self-supervised learning in Computer Vision - "Building World Models through Compatibility Estimation"

**Research Assistant,** Collaborative Robotics Lab @ UVA, Charlottesville, VA **November 2021 - Present**

- *Invented the concept of guided residual attention*, an innovative improvement over traditional residual connections in deep learning, contributed key inpainting idea in image to depth model (SDD)
- Created and trained novel multimodal learning models using PyTorch Lightning and a multi-GPU cluster environment that achieved *state-of-the-art object detection performance* on existing referring expression comprehension datasets
- Studied literature, developed research ideas, designed research experiments, discovered research challenges, led *large scale model training* (2 billion+ parameters) on cloud servers, and wrote multiple research papers
- Led team of 3 undergraduate students in development of simulator to automatically generate hundreds of thousands of data samples in Unity 3D using C#

**Forward Deployed Software Engineer,** Palantir Technologies, New York, New York **May 2023 - August 2023**
*Focus on Machine Learning*

- Developed entire real-time news analysis application leveraging large language models (LLMs) for ASPR (US government organization) to *rival existing billion dollar news analysis products*
- Managed Amazon EC2 instance cloud computing resources to develop machine learning pipeline for automatic evaluation of retrieval augmented Large Language Models (LLMs) responses
- Demoed work on news analysis application and retrieval augmented LLM pipeline to people ranging from the *head of machine learning* at Palantir and entire machine learning research team to *federal government employees*
    - News analysis application was also demoed to *head of AI at ASPR* (US government organization)
- Researched and utilized LLMs and several prompt engineering techniques to maximize product performance
- Brainstormed with machine learning research team on LLM fine-tuning with limited amounts of instruction data and automated retrieval augmented LLM evaluation

**Research Fellowship,** Collaborative Robotics Lab @ UVA, Charlottesville, VA **May 2022 - August 2022**

- Wrangled, cleaned, and visualized 500+ GB of data using Python (Pandas, Matplotlib, Numpy, Seaborn) to create 50+ data visualizations for three papers
- Reviewed three papers for NeurIPS 2022 Datasets and Benchmarks track
- Utilized and debugged simulator to produce over 1 terabyte of labeled data on a Linux-based server, conducted comprehensive data cleaning and wrangling

**Cofounder/Software Engineer,** Yurii LLC, Dumfries VA, GitHub **May 2021 - November 2021**

- Built a game for startup as lead software engineer, managed codebase of $10,000+$ lines of code
- Created spatially and environmentally aware Enemy AI using state machines
- Spent 20-30 hours per week building front-end and back-end and led biweekly meetings of $4-6$ people

**Teaching Assistant,** CS Software Fundamentals @ UVA, Charlottesville VA **August 2021 - December 2021**

- One of two TA's who aided in the creation of course content through developing exam questions and assisting in the creation of a major programming assignment
- Assisted 200+ students in solution generation and debugging on programming homeworks and labs

## SKILLS

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|---|---|
| **Deep Learning Tools/Frameworks** | PyTorch, PyTorch Lightning, Hugging Face, TensorFlow, JupyterLab/Colab Scikit Learn |
| **Programming Languages** | C++, C, C#, Java, Python, SQL, NoSQL, R, Bash, LaTeX, TypeScript |
| **Cloud Platforms** | UVA Research Computing (Rivanna), Amazon EC2 |
| **General Tools** | Git, Linux, Docker, Slurm, Amazon S3 (AWS), Unity3D, ROS |
| **IDE** | Visual Studio Code, Microsoft Visual Studio, Eclipse, Android Studio |
| **Web Programming** | Django, PHP, Javascript |
| **Database** | MySQL, SQLite |

## RELEVANT COURSES

- Machine Learning
- Machine Learning in Image Analysis
- Natural Language Processing
- Optimization for Machine Learning
- Data Structures & Algorithms
- Probability
- Statistics

- Linear Algebra
- Operating Systems
- Computer Architecture
- Advanced Software Development
- Robotics for Software Engineers
- Data Science with R
- Human Robot Interaction
- Differential Equations

## AWARDS AND ACHIEVEMENTS

- Dean's Summer Undergraduate Research Fellowship - one of less than ten 3rd years to receive this prestigious opportunity
- Alex and Barbara Sadler Scholarship - given to students based on financial need as well as a strong interest in the pursuit of a career in engineering
- Donald and Jean Heim Scholarship - awarded for being in the engineering school and maintaining a high GPA while demonstrating a need for financial aid
- Valedictorian of Forest Park High School

## SOFTWARE PROJECTS

VEX Robotics Absolute Position Tracking System

- Spearheaded my first software project, laying the foundation for my passion in programming
- Developed absolute position tracking system as well as complex motion algorithms involving PID, heading based control, and acceleration limiting using C++ that several teams across the United States later copied
- Worked so well that it was possible to mirror it for different positions and have it work

Motivational App

- Ventured into entrepreneurship, significantly boosting my self-learning capabilities
- Conceptualized idea for app to help motivate people by finding other similar people
- Formulated basic architecture and developed UI and backend in Java through Android Studio SDK

Computer Vision on Raspberry Pi

- Initiated my first artificial intelligence oriented personal project that drew me into the field of machine learning
- Implemented facial recognition algorithm on Raspberry PI using Computer Vision in Python
- Modified code to recognize multiple faces at a time

## PORTFOLIOS


- Email: alexi@virginia.edu
- LinkedIn: https://linkedin.com/in/alexiglad
- GitHub: https://www.github.com/alexiglad
- Website: https://alexiglad.github.io