ALEXI GLADSTONE

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EDUCATION

Incoming: University of Illinois Urbana-Champaign (UIUC), Computer Science **August 2024 - May 2027 (Expected)**
Ph.D. in Computer Science
• Advised by Professor Heng Ji and Professor Jim Rehg

University of Virginia (UVA), School of Engineering **August 2020 - May 2024**
Bachelor of Science in Computer Science — 4.0 Cumulative GPA — 4.0 Major GPA
• Admitted into Rodman Scholar Engineering Honors program — top 3% of UVA engineering students, graduated with highest distinction

PUBLICATIONS

- [Under Review] **Alexi Gladstone**, Ganesh Nanduru, Mofijul Islam, Aman Chadha, Jundong Li, Tariq Iqbal. "Cognitively Inspired Energy-Based World Models" **NeurIPS 2024**
- [Manuscript Preparation] **Alexi Gladstone**, Kshitij Bhatta, Zach Yahn, Autumn Routt, Tariq Iqbal. "How do noise level and task complexity affect communication modality effectiveness?" **HRI 2024**
- [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**, Sujan Sarker, Ganesh Nanduru, Md Fahim, Aman Chadha, Tariq Iqbal."Embodied Referring Expression Comprehension Through Multimodal Residual Learning" **ECCV 24**
- Md Mofijul Islam, **Alexi Gladstone**, Riashat Islam, Tariq Iqbal. "EQA-MX: Embodied Question Answering using Multimodal Human Expression" **ICLR 24 [Spotlight Acceptance Rate 5%]** [OpenReview]
- 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%]** [PDF]
- 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)** [PDF]

WORK HISTORY

Machine Learning Research Intern, Palantir Technologies, Seattle, Washington **May 2024 - Present**

- Worked on automatic unsupervised evaluation pipeline for Multimodal Large language Models (MLLMs), Visual Language Models, and Vision encoders
- Presented literature review on MLLMs and the future of multimodality

Research Assistant, Collaborative Robotics Lab @ UVA, Charlottesville, VA **November 2021 - May 2024**

- *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 paper)
- 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#

Research Assistant, Professor Jundong Li's Research Lab @ UVA, Charlottesville, VA **March 2023 - May 2024**

- Leading project regarding a new approach for the pre-training of autoregressive models using self-supervised learning in Computer Vision, "Cognitively Inspired Energy-Based World Model"
    - Trained autoencoders for decoding from a noisy latent space, energy-based models for video generation leveraging Markov Chain Monte Carlo sampling, and classification models for video action recognition
    - Conducted over one thousand experiments for novel energy-based model training approach and two innovative loss functions to optimize autoregressive model training approach stability and convergence

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

- Spearheaded 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)
    - News analysis application won an AI award from the Centers for Disease Control and Prevention
- 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

Summer Research Fellow, 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 two papers
- Utilized and debugged simulator to produce over 1 terabyte of labeled data on a Linux-based server, conducted comprehensive data cleaning and wrangling
- Self-studied machine learning and neuroscience. Formulated and researched "The Neuroplasticity Hypothesis"—a hypothesis inspired by the human brain revolving around residual connections, DenseNet, and ReLU [Blogpost]

Cofounder/Software Engineer, Yurii LLC, Dumfries VA, [Code] **May 2021 - November 2021**

- Cofounded a startup, was lead software engineer and managed codebase of $10,000+$ lines of code
- Spent 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

ACADEMIC SERVICES

Reviewer, Neural Information Processing Systems (NeurIPS) 2024
Reviewer, European Conference on Computer Vision, 2024
Reviewer, Neural Information Processing Systems (NeurIPS) Datasets and Benchmarks Track, 2023
Reviewer, Neural Information Processing Systems (NeurIPS) Datasets and Benchmarks Track, 2022

SKILLS

Deep Learning Tools/Frameworks	PyTorch, PyTorch Lightning, Hugging Face, TensorFlow, JupyterLab/Colab Scikit Learn
Programming Languages	C++, C, C#, Java, Python, SQL, 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 • Data Structures & Algorithms • Natural Language Processing • Machine Learning in Image Analysis • Operating Systems • Computer Architecture • Advanced Software Development • Robotics for Software Engineers • Data Science with R • Cybersecurity • Human Robot Interaction • Databases • Theory of Computation • Software Development Fundamentals • Digital Logic Design • Probability • Statistics • Linear Algebra • Discrete Math • Differential Equations • Cryptocurrency

AWARDS AND ACHIEVEMENTS

- Louis T. Rader Research Award—one of five undergraduate CS students (out of over 1400) to receive Louis T. Rader Research Award for my contributions as a research assistant at UVA
- CDC Accelerated AI Award—AI backed News analysis application from Palantir Internship in New York won an Accelerated AI award from the Centers for Disease Control and Prevention (CDC)
- Dean's Summer Undergraduate Research Fellowship—one of less than ten 3rd year students to receive this summer research 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 first self-motivated software project, laying the foundation for 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 inspired several robotics teams across the United States
- Demonstrated exceptional versatility and generalization in the solution by successfully mirroring the code across multiple positions, ensuring its adaptability and effectiveness in diverse scenarios

Motivational App

- First entrepreneurial venture, significantly improved self-learning capabilities as well as passion for software and teamwork
- Conceptualized idea for app named *Motif* to help motivate people by finding other people with similar interests during COVID
- Formulated basic architecture and developed UI and backend in Java through Android Studio SDK

Computer Vision on Raspberry Pi

- Initiated first artificial intelligence personal project, inspired my passion for machine learning
- Implemented facial recognition algorithm on Raspberry PI using Computer Vision in Python

PORTFOLIOS

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