

ALEXI GLADSTONE

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EDUCATION

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

PUBLICATIONS

- [Manuscript Preparation] **Alexi Gladstone**, Ganesh Nanduru, Mofijul Islam, Aman Chadha, Jundong Li, Tariq Iqbal. "Cognitively-Inspired Foundation Model Pretraining" **IJCAI 2024**
- [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, **Alexi Gladstone**, Ganesh Nanduru, Sujan Sarker, Keyan Du, Srikar Gouru, Tariq Iqbal. "COBRA: Comprehending Embodied Referring Expressions from Multiple Perspectives Using Language and Visual Cues" **TPAMI**
- [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** [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

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 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 - Present**

- Leading project regarding a new approach for the training of foundation models using self-supervised learning in Computer Vision - "Cognitively-Inspired Foundation Model Training"
 - 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 foundation 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)
- 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 project 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

- Assisted 200+ students in solution generation and debugging on programming homeworks and labs

SKILLS

Deep Learning Tools/Frameworks	PyTorch, PyTorch Lightning, Hugging Face, TensorFlow, 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

- Dean's Summer Undergraduate Research Fellowship - one of less than ten third year students to receive
- Alex and Barbara Sadler Scholarship
- Donald and Jean Heim Scholarship
- Valedictorian of Forest Park High School