

ELLIOT TOWER

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EDUCATION

University of Massachusetts Amherst

Amherst, MA

M.S. in Computer Science — Concentration in Data Science (3.85 GPA)

Sep. 2020 – May 2022

B.S. in Mathematics — Concentration in Computing, *Second major in Philosophy*

Sep. 2016 – May. 2020

Graduate Coursework

Neural Networks: A Modern Introduction

Empirical Research Methods in CS

Introduction to Simulation

Neural Networks & Neurodynamics

Algorithms for Data Science

Simulation & Causal Modeling

Advanced Natural Language Processing

Systems for Data Science

Game Programming

EXPERIENCE

Open-Source Project Manager — Farama Foundation

Mar. 2023 – Present

- Project manager & primary maintainer for *PettingZoo*—the standard API for multi-agent reinforcement learning (RL).
- PM for *Shimmy* (API conversion tool for external RL environments) and *Minari* (standard format for offline RL).
- Contributions to *Gymnasium* (standard API for single-agent RL), *Minigrid* (easily configurable gridworld environments).

Research Intern — Information Extraction and Synthesis Laboratory (IESL)

Jun. 2021 – Aug. 2021

- Collaborated to create novel architecture combining Case-based reasoning (CBR) with graph neural networks.
- Implemented KBC baselines and CBR model using [PyTorch Geometric](#), ran hyperparameter sweeps with [WandB](#).
- Coded data pre-processing pipeline and experiment setup, and optimized on-the-fly near-neighbor subgraph retrieval.
- [ICML publication](#): *Knowledge Base Question Answering by Case-based Reasoning over Subgraphs* (Das, 2022).

Data Science Industry Mentorship — Facebook AI Research (FAIR)

Feb. 2021 – Jun. 2021

Open Catalyst Project: using [Graph Neural Networks](#) to model & discover new catalysts for use in renewable energy storage.

- Adapted Graph Transformer to [PyTorch Geometric](#) for project-specific task: energy prediction from atomic structure.
- Benchmarked and achieved superior performance to popular atomic chemistry models: *SchNet*, *DimeNet* and *CGCNN*.
- Open-source contributions: Graph Transformer model, [Colab Notebook](#) for installing environment/dataset & training.

Data & Analytics Intern — Slalom Build

May. 2020 – Aug. 2020

- Engineered data pipeline architecture with AWS serverless components ([DynamoDB](#), [S3](#), [Kinesis](#), [Glue](#), [Athena](#)).
- Automated deployment of entire data pipeline system using [AWS CloudFormation](#) (infrastructure as code).
- Created live analytics dashboard for data-driven app development/monitoring using [AWS QuickSight](#).
- Developed analytics, crash reporting, and user tracking features for [React Native](#) mobile app (TypeScript).
- Presented results & architecture overview for senior management and consulting client, bi-weekly demos.

PROJECTS

Brain-Inspired Generative Replay (Continual Learning, Computer Vision) *with Prof. Hava Siegelmann (UMass Amherst)*

- Reduced catastrophic forgetting through novel selective replay method (choosing which samples to replay to model).
- Method inspired by neuroscience research: selective replay mechanism for memory consolidation in the human brain.
- Improved [brain-inspired replay](#) model: 21.3% to 25.1% on CIFAR-100 (Class-Incremental) with no added parameters.

SKILLS

Tools: PyTorch, TensorFlow, AWS, Docker, Bitbucket CI/CD, GitHub CI/CD, GitHub pages, pytest, setuptools, poetry, pypi.

Skills: Deep Learning, MLOps, Data Engineering, testing, documentation, python packaging, open-source development.