**ELLIOT TOWER**

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## EDUCATION

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| **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

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| Neural Networks: A Modern Introduction Neural Networks & Neurodynamics Advanced Natural Language Processing | Empirical Research Methods in CSAlgorithms for Data ScienceSystems for Data Science | Introduction to SimulationSimulation & Causal ModelingGame Programming |

## EXPERIENCE

**Software Engineer — Farama Foundation** Mar. 2023 – Present

* Project manager & primary maintainer for *PettingZoo*—the standard API for multi-agent reinforcement learning (RL).
* Developed and cut major releases for *PettingZoo* and *Shimmy* (API conversion tool for external RL environments).
* 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 architecturecombining 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 Transformerto 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 deploymentof 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 managementand 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.