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

Software Engineer — Farama Foundation — Mar. 2023 – Present

- Project manager and lead developer of *PettingZoo*—the standard API for multi-agent reinforcement learning (MARL).
- Developed & cut mature release for *Shimmy—an* API compatibility tool for popular RL environments (e.g., DM Control).
- Fixed major API inconsistencies, created Dockerfiles, expanded automated testing, documentation overhaul, tutorials.
- Onboarded new projects, created onboarding materials: release note templates, organization-wide project standards.

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).

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 SOTA atomic chemistry models: *SchNet*, *DimeNet* and *CGCNN*.
- Open-source contributions: Graph Transformer model, Colab Notebook for installing environment/dataset & training.

Data Engineering 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.
- 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: AWS, Docker, Bitbucket CI, GitHub CI, PyTorch, Ray, TensorFlow, LangChain, Sphinx, pytest, setuptools, poetry, pypi.
Skills: Deep Learning, RL, CV, NLP, Data Engineering, Project Management, Software Development Lifecycle, Testing.