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

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.

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.

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).

PROJECTS

Brain-Inspired Generative Replay (Continual Learning, Computer Vision)　　*with Professor Hava Siegelmann (UMass)*
- Reduced catastrophic forgetting through novel selective replay method (choosing which samples to replay to model).
- Improved brain-inspired replay model: 21.3% to 25.1% on CIFAR-100 (Class-Incremental) with no added parameters.
- Method inspired by neuroscience research: selective replay mechanism for memory consolidation in the human brain.

Open-Source Contributions (Reinforcement Learning)　　*with Farama Foundation (https://farama.org/)*
- Created compatibility wrapper & testing adapting DeepMind multi-agent evaluation suite Melting Pot to PettingZoo.
- Implemented board games: Gobblet & Cathedral, tutorials for training with RLlib, stable-baselines3, Tianshou, CleanRL
- Tutorials for running RL games in-browser using WebAssembly. Re-wrote rendering for Minigrid repo using Pygame.

SKILLS

Tools: PyTorch, TensorFlow, Ray, AWS, Bitbucket CI/CD, GitHub CI/CD, pre-commit hooks, pytest, setuptools, poetry, pypi.
Skills: Deep Learning, MLOps, Data Engineering, python packaging, testing, documentation, open-source maintenance.