Ella Morgan

Email: ellamorgan112@gmail.com Website: ellamorgan.ca Github: github.com/ellamorgan

Education

MSc in Computing, Field of Study in Artificial Intelligence Expected Apr 2023
Queen's University; GPA 4.0/4.3

BSc in Computer Science and Mathematics Sep 2017 - Apr 2021
Trent University; GPA 4.2/4.3

Skills

Languages and Technologies: Python, PyTorch, TensorFlow, SQL, C#, Weights & Biases, Git

Research Projects

Learning Planning Models from Noisy Observations (Python, PyTorch) May 2021 - ongoing
Master's research project

- Creating a dataset that generates visualizations of planning states with random variations based on PDDL files
- Researching and applying deep learning methods for learning to cluster data when some images represent the same class but are different visually. Evaluating how we can align noisy real-world observations with models known in advance

DreamerV2 Latent Space Interpretability (Python, Tensorflow) May 2021 - Aug 2021
NSERC USRA - full-time funded undergraduate research project ellamorgan.ca/portfolio/1-dreamerv2-eval

- Researched methods for interpreting a model's latent space and applied interpretability techniques to DreamerV2, a reinforcement learning agent trained on Atari games with a partially discretized latent space
- Created and performed tests to identify whether game concepts were easily identifiable in the latent encodings. Determined concepts were not easily separable, suggesting room for future improvements

Learning Graph Relationships in Spatiotemporal Data (Python, PyTorch) May 2020 - Aug 2020
NSERC USRA - full-time funded undergraduate research project ellamorgan.ca/portfolio/2-gm-lstm

- Assisted in creating a novel deep learning model that learned to predict time series on graphs. Model outperformed other state-of-the-art spatio-temporal models on the ability to remember long term dependencies across nodes in the graph
- Found, processed and cleaned 6 traffic and bike network datasets and created a synthetic dataset
- Reorganized and maintained the code base and set up a comparison with a competing model

Predicting Taxi Trip Length with Uncertainty (Python, Scikit-Learn, Keras) May 2019 - Aug 2019
NSERC USRA - full-time funded undergraduate research project ellamorgan.ca/portfolio/3-pred-intervals

- Implemented and compared methods for making regression predictions with intervals that convey uncertainty. Evaluated which methods best conveyed their uncertainty based on the size of intervals and whether they reflected the accuracy
- Presented results at AMMCS 2019 and was published in the conference proceedings

Course Projects

Solving Puzzles with Reinforcement Learning (Python, PyTorch) github.com/ellamorgan/solving-puzzles-rl

- Applied deep Q-Learning and discretized autoencoders to solve sliding tile puzzles given images of the states

Academic Paper Replication (Python, PyTorch) github.com/ellamorgan/latplan-pytorch

- Replicated the deep learning components of LatPlan, which learns PDDL planning models from noisy observations

Evolving Finite Automata (Python) github.com/ellamorgan/evolving-automata

- Used genetic programming to evolve finite automata given examples of strings that have a shared pattern

Work Experience

Teaching Assistant Sep 2019 - Apr 2021, Sep 2022 - ongoing

- Led seminars, recorded seminar videos, and held office hours for Calculus III, Probability, and Applied Calculus
- Marked tests, assignments, and exams for Formal Methods in Software Engineering, Computational Methods, Data Structures and Algorithms, Probability, Applied Calculus, Math for Everyday Life, and Digital World

Scholarships

- NSERC CGS-M 2021-2022 ($17,500)
- Vector Scholarship in Artificial Intelligence 2021-2022 ($17,500)
- Master's Tri-Agency Recipient Recognition Award 2021-2022 ($5,000)