Kausar Patherya

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Education

Georgia Institute of Technology **Aug. 2023 – Present**
Master of Science in Computer Science · Specialization: Machine Learning *GPA: 4.00/4.00*

University of Illinois at Urbana-Champaign **Aug. 2018 – May 2022**
Bachelor of Science in Industrial Engineering · Dean's List · Edmund James Scholar *GPA: 3.79/4.00*

Coursework

- Machine Learning
- Artificial Intelligence
- Reinforcement Learning
- Deep Learning
- Natural Language
- Computer Vision
- AI for Robotics
- Graduate Algorithms

Projects

Video Classification of Cichlid Fish Behavior | *tensorflow, keras* **July 2024**

- Selected by the McGrath Lab (acceptance rate ∼5%) to train deep learning models, achieving 75% categorical accuracy with a ConvLSTM network on 7,000 annotated fish clips, classifying sand disturbance into 10 behavior categories.
- Applied a variational autoencoder with density-based spatiotemporal clustering to identify sand manipulation events in 12-hour video footage, increasing behavior detection accuracy by 30% and reducing false positives by 25%.
- Optimized data pipeline by improving loading, frame augmentation, dimensionality reduction, and learning rate scheduling, reducing training time by 20% and achieving a 10% increase in model generalizability across datasets.

Training Intelligent Agents for Gameplay | *pytorch, opencv* **June 2024**

- Enhanced cooperative agent training in the Overcooked environment utilizing A3C, achieving a 60% increase above baseline performance by leveraging cooperation bonuses, custom reward functions, and communication strategies.
- Achieved high performance in the Lunar Lander problem by training an agent with Deep Q-Learning, attaining an average score of >200 points by optimizing network architecture and hyperparameters, and analyzing learning efficiency.
- Developed an agent to pass the Raven's Progressive Matrices (RPM) test with 78% accuracy, enabling it to visually reason by leveraging bitwise operations and DPR/IPR ratios to detect transformations across input frames.

Solidifying Machine Learning Fundamentals | *scikit-learn, mlrose-hiive* **April 2024**

- Conducted a comprehensive analysis of supervised learning algorithms including decision trees, neural networks, AdaBoost, SVMs, and kNNs on diverse datasets, using validation curves for hyperparameter tuning.
- Investigated randomized optimization methods like randomized hill climbing, simulated annealing, genetic algorithms, and MIMIC, comparing their efficacy against backpropagation for neural network weight optimization.
- Surveyed clustering and dimensionality reduction techniques, evaluating k-Means and EM outputs pre and post PCA, ICA, RP, and manifold learning. Utilized silhouette scores and elbow plots to determine optimal configurations.

Prior Technical Experience

Ernst & Young (EY) **July 2022 – May 2024**
Technical Consultant · Cloud Solutions Delivery *Chicago, IL*

- Developed a fraud detection bot for a $16B FinTech company utilizing RPA, saving 135 hours of annual productivity and generating a 5-year ROI of $600K. Received executive recognition for exceptional performance in bot development.
- Identified the preferred Microsoft Azure regions for a F500 MedTech divestiture, analyzing census data and considering cost and latency constraints. Collected 1800+ configurations for their M365 tenant and attained 8 cloud certifications.
- Led the develpment of a full-stack web application on AWS, leveraging IaC (Terraform) and CI/CD (GitHub Actions). Implemented a scalable backend using DynamoDB, API Gateway, and Lambda functions for efficient visitor tracking.

OTCR Consulting **Fall 2018 – December 2021**
President (2020-2021), Project Manager (2019-2020), Consultant (2018-2019) *Champaign, IL*

- Led UIUC's premier consulting club comprising 52 students across business and engineering, overseeing client engagement, project delivery, and recruitment. One of its longest-serving members and a proud alumnus.
- Designed an optimization algorithm to rearrange the inventory locations of an international distribution warehouse, generating annual savings of $44K due to fewer labor hours by removing bottlenecks within their outbound logistics.
- Implemented ARIMA models to accurately forecast minimum demand for bakery products at an F50 supermarket, optimizing inventory management and reducing product shrink by analyzing past sales, market trends and seasonality.