

Tameem Uz Zaman

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SKILLS

- Software Development
- Reinforcement Learning
- Amazon Web Services (AWS)
- Relational Database
- NoSQL Database
- Linux
- API Documentation
- Machine Learning
- Git Version Control
- Data Structures & Algorithms
- Programming Languages - Java, Python, C++.

EDUCATION

MS in Computer Science

The University of Texas Rio Grande Valley

CGPA - 3.75/4.0 (Nominated for Student Employee of The Year Award)

Bachelor of Computer Science

Major in Computer Networks & Security

University of Technology Malaysia (#181 QS Ranking)
CGPA - 3.7/4.0 (Dean's Award)

PROFESSIONAL EXPERIENCE

MARS Lab - The University Of Texas Rio Grande Valley

Sep. 2024 - Present

Graduate Research Assistant

- Under Dr. Qi Lu, researching Deep Reinforcement Learning in swarm robotics.
- Developed penalty based reward system, which increased foraging speed by 15%.
- Collaborating on projects involving AI-driven optimization, integrating Python and PyTorch.
- Used C++ in Argos simulation to simulate the robots in Linux.

CONFERENCE PAPER

Training Adaptive Foraging Behavior for Robot Swarms with Distributed Neuroevolution of Augmented Topologies [AAAI 2025]

The paper discusses the use of NeuroEvolution of Augmented Topologies (NEAT) to optimize swarm robotic foraging behaviors, focusing on resource retrieval efficiency and obstacle avoidance in dynamic environments. It highlights a novel penalty-reward system to improve coordination and minimize energy expenditure, demonstrating the advantages of NEAT over traditional swarm algorithms.

[GitHub Link](#) [AAAI25 Paper Link](#) [AAAI25 Poster Link](#)

LATEST PROJECT

TD Actor-Critic Algorithm for LunarLander-v2

Key Contributions:

- Designed neural networks for Actor (policy) and Critic (value) components to enable effective spacecraft landing.
- Utilized softmax for action probabilities, balancing exploration and exploitation.
- Fine-tuned hyperparameters to optimize training performance.
- Tracked training progress with TensorBoard, demonstrating convergence to successful landings.
- Saved and tested the trained model for effective operation in the simulated environment.

[GitHub Link](#)

Deep Q-Learning for MountainCar-v0

Key Contributions:

- Designed and implemented a Deep Q-Network (DQN) using PyTorch to train an agent for the MountainCar-v0 environment in Gymnasium.
- Optimized the training process with experience replay, target network updates, and epsilon-greedy exploration.
- Achieved efficient learning by fine-tuning hyperparameters, enabling the agent to solve the environment consistently.
- Incorporated reward shaping and checkpointing for progress monitoring, and utilized TensorBoard for performance visualization.

[GitHub Link](#)

Optimizing Swarm Robotic Foraging using NEATFA Python [Ongoing]

Key Contributions:

- Implemented and evaluated a swarm robotics simulation in ARGoS with NeuroEvolution of Augmenting Topologies for Foraging Algorithm (NEATFA) to optimize food retrieval tasks.
- Enhanced robot decision-making by processing sensor inputs (proximity, light, compass) with neural networks and assigning rewards for task completion.
- Debugged and resolved issues related to genome fitness evaluation and speciation, ensuring accurate simulation results and improved convergence.

[GitHub Link](#)