Shailendra Sekhar Reddy Bathula

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EDUCATION

University of Georgia Athens, Georgia *Master's in Artificial Intelligence*   *Graduation Date: Aug 2024*

Gandhi Institute of Technology and Management Hyderabad, India

Bachelor's in Electronics and Communication Engineering   *Graduation Date: Apr 2019*

WORK EXPERIENCE

National University of Singapore, Singapore

Data Science Intern   *May 2019 - Jun 2019*

- Employed exploratory data analysis techniques to identify trends & correlations within daily news for stock market predictions.
- Developed a cutting-edge predictive model with Convolutional Neural Networks & Long Short-Term Memory to forecast stock market opening values from news headlines.

University of Georgia Athens, Georgia

Graduate Research Assistant   *Jan 2023 - Aug 2024*

- *Synthetic Instincts: Imitation Learning on DRL Agent for Autonomous Construction of Behavior Trees*
- We introduced a novel framework designed to bridge the gap between the high performance of DRL and the desirable transparency and verifiability of Behavior Trees. By employing imitation learning to mimic and transfer the expertise of a reinforcement learning model, we pave the way for generating BTs that are not only as effective as RL but also transparent, interpretable, and readily verifiable for real-world problems. The motivation behind the work is to identify plausible conditions necessary or sufficient for every action the agent takes. We also extend this framework to a multi-agent setup considering collaboration and try to cement the fundamentality of the framework in real-time applications.

PROJECT EXPERIENCE

Decentralized Multi-Agent Task Allocation System   *Jan 2023 - Apr 2023*

- Developed a decentralized multi-agent task allocation system that dynamically assigns tasks based on agent battery life and travel time optimization, enhancing operational efficiency.
- Innovated a battery-aware task allocation approach, significantly improving system longevity and performance in prolonged operations by considering agents' battery status.
- Implemented real-time algorithms for optimal task-agent pairing, ensuring efficient task allocation, reducing completion time, and designing a scalable system applicable to various contexts like logistics and manufacturing.

Autonomous Maze Navigation using SLAM   *Aug 2022 - Dec 2022*

- Developed 3D SLAM algorithms (Gmapping, Cartographer, and Hector SLAM) to build dynamic visual maps of indoor mazes in changing environments to track the position of a robot.
- Integrated motion control algorithms with reactive pathfinding techniques employing left-hand rule & right-hand rule, enabling autonomous navigation of waypoints.
- Optimized robot route planning & movement.

Formula 1 Race Winners Predictor   *Jan 2022 - Apr 2022*

- Performed data preprocessing, including cleaning and transforming a historical race dataset with over 10,000 observations and 70+ variables, achieving 99.99% data integrity accuracy.
- Extracted and engineered key features from raw datasets, identifying influential factors that enhanced model performance by 15%.
- Calibrated and optimized 6 machine learning models (e.g., Decision Tree, Random Forest, KNN, SVM), achieving a best-in-class predictive accuracy of 93% and an overall precision of 87%.

Comparative Analysis of Different Deep Reinforcement Learning Algorithms   *Aug 2021 - Dec 2021*

- Built and trained different value-based reinforcement learning agents to master the game Freeway.
- An in-depth performance analysis of Q-learning, Deep Q-learning, Double Deep Q-learning, and Duelling Double Deep Q-learning was done to understand the difference in learning between these methods.
- Almost all the models achieved a 90%+ success rate for this particular environment.