MALHAR BARBHAYA

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Education

University of Alberta	**September 2022-present**
Bachelor of Science in Computer Science	*Edmonton, AB*

Experience

Reinforcement Learning Research Intern	**January 1st 2024- April 31st 2024**
University Of Alberta	*Edmonton, Alberta*

- Developed a Python-based Reinforcement Learning (Reinforcement Learning) model for automating a Fluid Mechatronix machine, achieving seamless control over parameters such as water flow speed, inlet/outlet pressures, flow rate, and RPM.
- Designed and implemented an intuitive user interface using DASH for real-time data visualization, enabling the manager to monitor and control machine operations efficiently.
- Enhanced the RL model to autonomously operate the entire system, optimizing performance and providing valuable insights for further reference.
- Currently leading efforts to transition the Reinforcement Learning system into a multi-modal framework. This involves creating a supervisor model to intelligently select Reinforcement Learning agents based on specific variables and implementing a fault detection system for cyber-attack mitigation.
- Acquired expertise in TensorFlow, multiprocessing, threading, and async.io, and applied them to streamline processes and improve system efficiency.
- Collaborated with the Chemical and Material Engineering department to integrate Rockwell automation technologies and educational equipment into the Fluid Mechatronix system.
- Contributing to the development of a fault detection algorithm utilizing causal inference, ensuring quick identification and resolution of uncertainties in machine behavior.
- Proactively engaged in a four-month internship, demonstrating adaptability and learning agility while mastering diverse programming paradigms and cutting-edge technologies.

Achievement

Won DevelopEd 2.0 HACKATHON	**September 2023**
Secured 2nd place in the first hackathon in Tinker's category	*Edmonton, Alberta*

- Created project Scheduler ⊙ Project which is a dynamic and responsive schedule-maker that has a nested, priority-based algorithm for tasks which the user considers primary or fixed in their schedule, and secondary tasks which they want to complete but don't know when.

Software Development Job Shadow at PLACE: Prominent Real Estate Company	**September 2023**
Front End Developer Intern	*Edmonton, Alberta*

- Explored a range of programming languages, tools, and industry-leading services to broaden my technical knowledge. Collaborated with team members using version control systems such as Git to organize modifications and assign tasks.

Projects

Scheduler | *Python, Flask, HTML, CSS, JS* | ⊙ Project	**September 07**

- Developed a dynamic and responsive schedule-maker web application.
- Used Python for scripting and back-end algorithm, Flask to connect the back-end with the front-end, and HTML/CSS/JS for front-end webpages.
- Hosted the website on Zeet and Google Cloud Platform.

Neural Network-based Pong AI using NEAT | *Pygame, Python, AI* | ⊙ Project	**July 2023**

- Developed a dynamic Pong game using the pygame library. Integrated the NEAT algorithm, designed for evolving neural network architectures and parameters, enabling AI models to adapt and improve over time.
- Designed the AI to play against either other AI opponents or human players
- Utilized pygame to provide real-time visualization of AI interactions and player scores during gameplay.

Certifications

- Machine Learning Specialization (Certificate)
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization (Certificate)
- Neural Networks and Deep Learning (Certificate)