Malhar Barbhaya

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About Me

Driven second-year Computer Science undergrad at the University of Alberta. As a process control lab assistant, I lead the development of a cutting-edge reinforcement learning model to automate fluid mechatronics systems, while also developing a laboratory demonstrating a Cyber-Attack detection system for industrial use. With a proven track record in hackathons, I excel in diverse environments, fostering impactful collaborations. Committed to innovation and excellence, I'm dedicated to leveraging technology for positive change

Education

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

Experience

Process Control Lab Assistant **January 2024 - April 2024**
University of Alberta *Edmonton, Alberta*

- Developed a Python-based Reinforcement Learning (RL) model to automate a Fluid Mechatronix machine, resolving post-logging crashes and improving operational efficiency.
- Created a Cyber-Attack detection system through extensive research and implementation using Python frameworks, enhancing system resilience.
- Designed a user-friendly web interface using Dash, allowing remote operation of the fluid mechatronics system while enabling real-time monitoring of machine variables and behavior through interactive graphs and plots.

Achievement

Won DevelopEd 2.0 Hackathon **September 2023**
Secured 2nd place in hackathon *Edmonton, Alberta*

- Created project Scheduler (GitHub) which is a dynamic and responsive schedule-maker.
- Awarded an exclusive opportunity to participate in a Software Development Job Shadow at PLACE as a direct result of winning the hackathon.

Projects

Scheduler | *Python, Flask, HTML, CSS, JS* | GitHub **September 2023**

- 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*| GitHub **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 game to play in AI vs AI version or AI vs user version
- Utilized pygame to provide real-time visualization of AI interactions and player scores during gameplay.

Skills

- **Programming Languages & Technologies:** Python, Flask, C++, C, Java, HTML/CSS/JS, Pygame, LaTeX
- **Tools & Frameworks:** Reinforcement Learning, DASH, NEAT, Git
- **Software & Libraries:** Pandas, NumPy, Matplotlib, TensorFlow, MongoDB, SQL
- **Miscellaneous:** Process Control, Machine Learning, Artificial Intelligence, Web Development, Multiprocessing

Certifications

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