Ben Paul Varghese

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EDUCATION

International Institute of Information Technology (IIIT-H), Hyderabad, India   September 2020 - Present
Bachelor of Technology in Computer Science and Engineering   *GPA: 8.11/10*

EXPERIENCE

RL for performing Self-Adaptation of Software Systems   August 2023 - Present
Prof. Karthik Vaidhyanathan   *Software Engineering Research Centre, IIIT-H*
− Currently working on building a reinforcement learning algorithm to perform self adaptation of software systems using SWIM web system exemplar to simulate traffic. Used Q Learning and Proximal Policy Optimization algorithms to manage the the number of active servers and the dimmer value to produce high utility and ensure good user experience.

Frontend Intern   May 2023 - August 2023
Neobase   *Hyderabad, India*
− Explored popular blockchain libraries like Wagmi and Ethers. Developed and maintained reusable components for multiple web projects using Next.js, TypeScript and Tailwind CSS; followed best coding practices.

Use of Reinforcement Learning in Games   January 2023 - May 2023
Prof. Praveen Paruchuri   *Machine Learning Lab, IIIT-H*
− Did a thorough review of OpenAI's multi agent system implementation of hide and seek using Proximal Policy Optimization Algorithm. Also gained a strong understanding of the fundamentals of Reinforcement Learning and developed Q Learning, Deep Q Learning, and REINFORCE algorithm implementations of Snake and CartPole. DQN implementation of Snake consistently gave scores 4 to 5 times higher than the baseline.

UI/UX Intern   November 2022 - May 2023
Inclusive Growth Chain (IGC)   *Hyderabad, India*
− Developed IGC's website completely from scratch using ReactJS and made it responsive for mobile use.
− Led the frontend development of IGC's project with IIT Dhanbad to create a website interface for farmers in rural India to sell their lac (a resin like farm produce) at a fair price without the involvement of middlemen. The website also allows for farmers to apply for loans, get the latest crop advisories, and much more. Also handled API integration with backend.

Software Development Intern   January 2022 - April 2022
Designocare   *Hyderabad, India*
− Created an android app for users to monitor their temperature readings using an external device. Development was done using React Native, ExpressJS, MongoDB, and NodeJS, and following AGILE methodology.

PROJECTS

Unsupervised Domain Adaptation by Backpropagation
− Currently working on implementing domain adaptation from labelled source datasets to unlabelled target datasets by introducing a gradient reversal layer in a feed forward neural network.

Automatic Negotiation Agent (GitHub)
− Implemented a negotiating agent following Nash Bargaining Solution approach towards finding the optimal agreement point to ensure high utility values. Also took into consideration the total social welfare measure of all negotiating agents by making an opponent frequency model to learn and predict opponent moves.

Another Day (YouTube)
− Built a retro themed 3D survival horror game from scratch using Unity. Game is a standard keyboard and mouse game involving a comprehensive story, featuring multiple cutscenes, dialogues, mysterious elements, and intense battles.

CineStream
− Implemented a dummy OTT by defining functional and non-functional requirements and implementing both monolith and microservices architectures. Development was done using MERN stack.

xv6 OS (GitHub)
− Tweaked the xv6 operating system by adding system calls - one to trace the systems calls made by a command, another to change the priority of a process. Added two new schedulers - First Come First Served and Priority Based Scheduling.

Temporal Analysis of Mangrove Forests
− Used Random Forest and SVM classifiers to detect mangrove regions in the Krishna Basic Sanctuary. Classification was done across two decades in intervals of 5 years to investigate the change in mangrove area in the sanctuary over time.

1st place at the BUIDL FOR WEB3 Hackathon (GitHub) (YouTube)
− Created a website that enables property owners to list their properties as NFTs and use a token sale to bring on co-owners. Additionally, the website offers the capability to rent out properties and allocate the rent income among the owners based on their share of tokens.