Parshan Javanrood

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EDUCATION

University of British Columbia — Vancouver, BC
Bachelor of Applied Science in Computer Engineering; GPA: 4.24/4.33 (92.8/100) — September 2021 – Present

- **Coursework**: Machine Learning and Data Mining, Algorithms & Data structures, Software Construction, Operating Systems, Probability and Statistics, Linear Algebra, Digital Systems Design
- **Co-op program**: Available for 4 or 8 months
- **Awards**: Trek Excellence Scholarship, Dean's Honour List(2021-22, 2022-23), Faculty of APSC Top Student Scholarship

EXPERIENCE

Software Engineer Intern: Video Codec — Vancouver, BC
NETINT Technologies — May 2023 - Present

- Create a **full-stack web app (Flask, React, SQLite)** to showcase simulation results and compare the performance of different codecs
- Collect, label, and clean the data of more than **40,000 simulations** with **Python and SQLite**
- **Debug and automate** the simulation process with Python scripts and efficiently manage the video processing workload using **Slurm**, **decreasing the simulation time by 60%**
- Develop quality metrics using statistical methods such as **PSNR, SSIM, and VMAF**, to evaluate the performance of video codecs
- Contribute to the implementation and testing of video encoding/decoding using industry standards such as **H.264, H.265, and AV-1** on **GPU cards**, ensuring compliance with high-quality standards

Undergraduate Research Assistant — Vancouver, BC
UBC Cloud Infrastructure Lab (CIRRUS) (Link) — starting April 2023

- I will start this role in **April 2023**, under the supervision of **Dr. Mohammad Shahrad**
- Study the computational workload of **Function as a Service(FaaS)** serverless backends in the cloud

Embedded Software Developer — Vancouver, BC
UBC Bionics Design Team — January 2022 - Present

- Converted functionalities of an open-source library from **C++** to **Rust** to receive transmitted signals from an **Electromyography**(EMG) device
- Utilized **Linux Pipes** for transferring data between 3 **concurrent** processes, connecting different components of the program, and used **Mutex Locks** to protect shared resources
- Developed a **Watchdog thread**, that communicates with the main loop using **TCP** connection, and monitors the activity of the program, to retrieve in case of crashes
- Collaborated with peers in Software, Analytics and Electrical sub-teams to incorporate electrical and analytical modules of the system

Undergraduate Teaching Assistant — Vancouver, BC
UBC Math Department & Computer Science Department - MATH 110, APSC 160 — August 2022 - Present

- Co-facilitate weekly **workshops**, and helped **50+ students** to practice mathematical and programming concepts, such as **Differential Calculus**, **Embedded Programming** with Arduino, and **Data Analysis** with Excel
- Conducted **problem-solving sessions** to prepare students for midterms and finals

TECHNICAL SKILLS

- **Languages**: Python, Java, JavaScript, C/C++, Rust, SQL, R
- **Technologies**: Git, Unix, Flask, SocketIO, ExpressJs, MongoDB, SpringBoot, Scikit-Learn, Google Cloud, HTML/CSS
- **Skills**: Data Visualization, Hypothesis Testing, Statistical/Bayesian Inference, ML Algorithms, Cloud Computing

TECHNICAL PROJECTS

Clash of Pawns: Full-stack Chess WebApp(Link) — Personal Project
ExpressJs, MongoDB, SocketIO, HTML, CSS — February 2023

- Created a **full-stack** chess web app using **HTML/CSS/JavaScript, Express, NodeJS, MongoDB, and SocketIO**
- Implemented a **secure user authentication** system with hashed password storage and **express-session** to restrict unauthorized access
- Utilized **sockets** to enable **real-time communication** between players, including messaging and moving pieces
- Demonstrated expertise in managing **asynchronous requests/responses** and building data structures for socket channels

Water Quality Prediction using Machine Learning(Link) — BizTech Competition
Python, Scikit-Learn, Pandas, Numpy, Matplotlib — March 2023

- Analyzed over **15,000** satellite images from **Landsat 8** and developed an algorithm using multi-wavelength analysis to **detect water**
- Employed metrics such as **NDVI, AWEI, and MNDWI** to assess water quality in various regions
- Developed a **KNN** regression model to predict water quality based on extracted features and achieved **76% accuracy**

Voice Controlled Smart Home Assistant(Link) UBC(Course Project)
Flask, HTML/CSS, JavaScript, JS Canvas, Raspberry Pi, SpeechRecognition, Cohere.ai February 2023

- Implemented a **voice-activated** smart home assistant using Python's **speech recognition library**, which allowed users to control servo motors and LED lights with voice commands
- Developed a frontend using HTML, CSS, and JS that included a **soundwave visualization** component created using the **JS canvas**
- Created a **NLP** model using **Cohere.ai** to extract intentions from text, improving the accuracy of the voice recognition system
- Utilized **sockets** to establish a seamless connection between the Raspberry Pi and the server, ensuring **real-time feedback**

Twitter + Pub-Sub Server(Link) UBC(Team Project)
Java, Twitter API, Socket, JUnit 5 November 2022

- Built an **asynchronous messaging service** that allows simultaneous connection of multiple clients
- Developed features enabling clients to send and receive **direct messages** from other users, as well as **subscribing to twitter** users, and listening for tweets that contain certain keywords
- Utilized **Twitter API** to get users' tweets, and subscribe to their stream of new tweets
- Created abstract data types to handle **concurrent** mutations from different users
- Used **sockets** to communicate with clients over **TCP network** in form of encrypted **JSON** requests/responses

Algorithmic Trading Bot (Link) Personal Project
Python, WebSocket, Pandas, NumPy, Google Cloud July 2022

- Coded an Algorithmic trading bot for crypto and stocks that operates in the 1-minute timeframe and returns an average profit of **8% per day**. The bot is automated on a **VM** hosted by the Google cloud
- Used the Alpaca API and utilized **HTTP** requests and **WebSockets** to transfer data
- Performed quantitative analysis using **Pandas** and **NumPy** libraries, and **Matplotlib** for data visualization
- Utilized **SMA strategy** to recognize buy and sell signals, and forecast the most profitable time-period pairs by backtesting

Crash Linux Shell UBC(Course Project)
C, Linux March 2023

- Developed a **Linux-based** shell program called "crash" for managing up to **32 concurrent processes** and handling various Linux signals
- Implemented functionality for changing the status of processes from **foreground to background**, **stopping and resuming processes**, and managing **shared memory**
- Utilized appropriate **masking of signals** to modify global data structures and ensure efficient program execution

Natural Language Processing(NLP) with Ngrams UBC(Team Project)
Java, JUnit 5 September 2022

- Deployed a multi-purpose machine learning model that utilizes **Ngrams**, and performs statistical analysis using **Naïve Bayesian algorithm** to determine textual similarity
- Trained the model with data from RateMyProfessors website to perform Sentimental analysis, and predict the score of a professor with **87% accuracy** solely based on their review
- The model can classify words with similar meanings by analyzing their usages in the training data and calculating the **Cosine Similarity** of their Ngrams

Kamino Game(Link) UBC(Team Project)
Java, JUnit 5 November 2022

- Kamino is a missing spaceship and our objective is to find it in the map of planets
- Developed an **abstract data type** to model the planets and the connection between them as graphs, and utilized **Adjacency list** to represent the graphs
- Applied different search algorithms such as **BFS**, **DFS**, and **Dijkstra's algorithms** to efficiently travel between planets

HONORS AND AWARDS

International Collegiate Programming Contest(ICPC) December 2020

- Participated in the Asia regional contest hosted by Sharif University of Technology
- Placed among the **top 20 teams**, out of more than 60 participating student teams, and **advanced** to the second round

International Olympiad on Astronomy and Astrophysics(IOAA) Gold Medalist October 2020

- **Individual Competition**: Placed among the top 27 gold medalists, out of 278 participants
- **Team Competition**: Ranked 3rd between 42 participating teams. Coordinated the team's communications and helped overcome the significant time difference between members