SANAT BHALLA

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EDUCATION

University of Waterloo | *Waterloo, Canada* Sept 2020 – August 2024 (expected)

- Candidate for Bachelor of Computer Science **(Specialization in Software Engineering)**
- President's Scholarship of Distinction **(3.7/4.0 GPA)**
- Member of UW Computer Science, Data Science & Blockchain Club

WORK EXPERIENCE

Quantitative Team Lead (Market Research) | *Wat Street, Waterloo* May 2023 – Present

- Leading a research team to develop strategies/algorithms using Statistical Analysis and Machine Learning to solve complex problems

Developer (Cloud Engineering) | *PwC Canada, Toronto* Sept 2022 – Feb 2023

- Partnered with developers and PMs to deliver a web-based CI Tool boosting yearly revenue by **$1.2M**
- Drove the implementation of a comprehensive set of user engagement features including likes, comments, messaging, and notifications; enhanced user retention by **30%** and increased screen time by **3 minutes**
- Designed an **Observable Design Pattern** on the frontend with **React.js** and **MVC Design Pattern** on the backend with **Nest.js**
- Injected custom **Node.js** microservices to optimize database queries by **40%**
- Optimized frontend performance by **70%** by restructuring the codebase, leveraging **Pagination** with React.js and integrating caching techniques, resulting in faster page load speeds and reduced bounce rate by **25%**
- Accommodated multi-tenant support using **MSAL SSO** with **Azure AD** cutting yearly costs by over **$200k**

Embedded Software Developer Intern | *Ford Motor Company, Waterloo* Jan 2022 – April 2022

- Engineered and implemented a new UI framework for Ford's In-Vehicle Infotainment Systems in collaboration with a team of 7; reduced system latency by **50%** and boosted user satisfaction score by **35%**
- Built customized micro-hooks using **TypeScript** and **React.js** in optimizing the codebase
- Developed C/C++ modules to render React Native components on the **Unreal Engine** to increase the screen responsiveness by **55%** compared to the web
- Improved the message parsing and queuing architecture using **Concurrency** on a highly multi-threaded **Distributed System**, reducing processing time by **60%** and improving system scalability by **40%**
- Redesigned CSS animation library Bezier Easing using **C/C++** for React Native UI improving performance by **40%**
- Revised buffer transmission from **JSON** to **Flatbuffers** improving Serialization and Deserialization by over **97%**

Cloud Infrastructure Development Intern | *Innovapost Inc., Ottawa* May 2021 – Aug 2021

- Designed and implemented an Initial and Delta Load ELT Pipeline for data migration, processing **10+ TB** of data achieving a **75%** reduction in data processing time
- Orchestrated data pipeline using **Azure Data Factory** and made **Spark** API calls for multi-dimensional data transformations and reduced processing costs by **25%**
- Redesigned Python APIs introducing Batch Operations to lower RUs per second cutting down costs by **30%**
- Achieved **100%** code coverage testing **30k+** lines of code using **PyTest**, resulting in a **40%** reduction in regression bugs and a **30%** improvement in code quality

SKILLS

Languages: C/C++ | Java | Python | JavaScript | TypeScript | Swift | SQL | R | HTML/CSS

Libraries & Frameworks: React.js | React Native | Node.js | Nest.js | Spring Boot | Flask | Django | Unreal Engine | Docker

Tools & Services: Git | MongoDB | Flatbuffers | JIRA | Azure | AWS | GCP

PROJECTS

Crypto Trading Bot

- A web application to predict changes in Crypto prices based on **Market Sentiment** and **Statistical Analysis** with an accuracy of **67%**
- Led a team to design an Ensemble Machine Learning model (**Time Series** & **NLP**) boosting efficiency by **30%**
- Architected and deployed a CI/CD ETL Pipeline using **PySpark** saving **20+** hours per week and reducing processing time by **50%**
- Currently integrating **Blockchain** to enable seamless wallet connectivity and real-time trading
- Stack – Python, Spark, TypeScript, React.js, Node.js, Mongo