MOHAMMAD RAHMAN

647-768-9768 · mohammadk.rahman@mail.utoronto.ca · mohammadrahman.me

SKILLS

Languages:

C/C++, JAVA, PYTHON, JS, HASKELL, PROLOG, RACKET, PERL, MATLAB, MIPS ASSEMBLY

Technologies:

GIT, JIRA, REACTJS, ANGULAR ,MYSQL, DOCKER, BASH, AWS, GDB, GIDRA, ESP IDE

Courses:

CSCD01 [ENGINEERING LARGE SOFTWARE SYSTEMS]
CSCC01 [INTRO TO SOFTWARE ENGINEERING]
CSCC09 [WEB PROGRAMMING]
CSCC43 [DATABASE SYSTEMS]
CSCC24 [PRINCIPLES OF PROGRAMMING LANGUAGES]

EDUCATION

COMPUTER SCIENCE SPECIALIST IN SOFTWARE ENGINEERING CO-OP

UNIVERSITY OF TORONTO [2019-PRESENT]

WORK EXPERIENCE

WEB DEVELOPER

MAY 2023 - DEC 2023

SWAP ROBOTICS [REACT JS, NODEJS, MOBX, AWS SERVICES, DOCKER, POSTGRES/TIMESCALEDB, ROS2]

- Developed new features and improved functionality of the swap web applications and robot firmware using the latest technologies in micro services, cloud computing, and robotics like AWS, ReactJs, MobX state solution, TimescaleDB, and ROS2.
- Created a web portal feature to allow operators to change robot firmware versions and download firmware images using tools such as ReactJs, Docker, AWS ECS and python to improve downtime.
- Automated deployment of serverless code to AWS lambda from github and update associated libraries by developing custom scripts in python and boto3 to improve code maintainability and deployment time.
- Developed secure web portal estop to allow operators to emergency pause robots during operations by adding estop support to robot firmware and frontend changes in gui using ReactJs
- Created custom logging utilities to aggregate and store logs from 20+ ROS nodes to AWS CloudWatch in real time to get a holistic picture of the robot state for rare bugs.
- Improved accuracy of robot statistics dashboard by resolving technical bugs in our data collection pipeline with timescale db and reactjs
- Added Progressive Web Application support using Server Sent Events protocol with minimal network usage communicate ReactJs updates from Node Js backend api.
- Reduced downtime for operators by moving robot path generation to AWS Lambda and configured ReactJs webportal.

SOFTWARE ENGINEER

SEPT 2022 - DEC 2022

UNIVERSITY HEALTH NETWORK – KIDNEY HEALTH EDUCATION RESEARCH GROUP

- Developed and maintained python software stack to ensure the integrity of and for the smooth processing of patient data under an agile scrum environment.
- Maintained and developed web applications across 4 websites in PHP and MySQL within the word press framework.
- Developed automated scripts using python, MS Graph API, Teamwork API, and MySQL to auto create channel structure, transfer critical task history for 4000+ tasks, and documentation from teamwork to teams for 30+ groups.

TEACHING ASSISTANT

JAN 2022 - APRIL 2022

CSCB58 – COMPUTER ORGANIZATION

- Asked insightful and targeted questions to gauge student comprehension of weekly lab material.
- Reduced time marking by creating 2 long and 2 short difficult to solve but easy to mark questions for 2022 winter exam.
- Improved student problem-solving abilities and understanding of concepts through one on one guidance of challenge problems during office hours.

PROJECTS

CANVASSA COLLABORATIVE WHITEBOARD [REACTJS, MONGODB, KUBERNETES, DEVOPS]

WEB PROGRAMMING

- Created a responsive WebGL whiteboard using the threejs framework to allow clients to easily draw with variety of pencils and brushes, import and scale images, and draw clean crisp diagrams.
- Decreased latency for world wide users from 500ms to 30ms by creating a RESTFUL intelligent load balancing API that spins up containers in the nearest geographical region.
- Decreased deployment time by applying principles of Continuous Integration and Continuous Development(CI/CD) to create an auto deployment system using tools such as github actions, docker, and google cloud services.

EASLYAPPLY JOB SEARCH WEB APPLICATION [REACTJS, MONGODB, KUBERNETES, JIRA, AGILE]

INTRODUCTION TO SOFTWARE ENGINEERING

- Allowed easy React Module integration by developing an easy to use and comprehensive database access API for MongoDB which increased team sprint velocity
- Decreased deployment time by leveraging strong knowledge of docker containerization and Git CI/CD to automatically test, compile, and deploy code to google cloud servers (similar to Azure)
- Allowed easy navigation of EasyApply web application through effective use of good UX design principles in developing HTML/CSS web pages.
- Showed relevant job seeker elevator pitch videos to employers by implementing strong short term LSTM model optimizing for employer attention

COURSE ADMINSTRATION WEBSITE [PYTHON FLASK, SQLITE, AGILE SCRUM]

PINTRODUCTION TO DATABASES AND WEB APPLICATIONS

- Created a secure session and login system in Python, by applying good practices for password storage and providing and managing expirable session tokens to logged in users. This protects user’s login credentials from malicious attackers and prevents hijacking of user sessions.
- Developed an intuitive easy to use web interface to allowed professors and TAs to grade, create assignments, and upload lecture materials and for students to view courses they are enrolled in, submit assignments, and view their grades.
- Created a space efficient and easily extensible SQL database solution by effectively defining functional dependencies to define good constraints for our system, and by selectively choosing pros and cons of different ER models.

EXTENDED THE PINTOS OPERATING SYSTEM [IN C]

PINCIPLES OF OPERATING SYSTEMS

- Allowed program agnostic execution in Pintos by effectively designing and implementing a robust memory management system.

- Created space efficient storage and lookup of virtual addresses through strong knowledge and use of sparse data structures and use of CPU specific hardware.
- Developed a fast to execute and statistically correct swapping algorithm using a modified round robin promotion algorithm with strong algorithmic design skills in a group project.

HANDWRITING RECOGNITION MACHINE LEARNING [IN C]

MACHINE LEARNING AND DATA MINING

- Created an efficient and multithreaded KNN model to recognize writing for an academic project
- Decreased model runtime by 400% by applying advanced pruning strategies in the training process.
- Implemented a CUDA base acceleration for the model allowing fast image to text conversion.

CREATED PHYSICS GAME ENGINE USING [JAVA OPENGL]

PERSONAL PROJECT

- Accelerated 3D physics calculations by 50% through strong understanding of data structures and algorithms by parallelizing physics calls and implementing a fine/coarse sub sectioning algorithm.
- Reduced VRAM usage by 4 times using strong knowledge of graph data structures to space efficiently link individual texture transformations to many models.
- Allowed soft body collisions between objects by leveraging strong understanding of data structures through implementing an oriented node system
- Simplified the creation of models and implementation of game logic through development of Object-Oriented Game Object API, leveraging strong understand of software design principles