Alexander Shah

Software Engineer

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Languages Java, C/C++, Python, Scala, JavaScript, HTML, CSS, SQL, MATLAB

Tools / Tech Git, Bash, PostgreSQL, ReactJS, jQuery, Flask, OpenGL

Experience

SideFX | **3D Software Developer - R&D** | C++, MATLAB | *Winter 2018*

- Developed an algorithm for approximate 3D convex decomposition that uses **iterative graph cuts** and **linear classification** to find **optimal clipping planes**
- Obtained meaningful measures of concavity by using the Geodesics in Heat algorithm to trace paths along 3D meshes

PaveAI | **Software Engineer - Full Stack** | Python, Javascript, SQL | *Summer 2017*

- Designed an async service with Celery and Redis to distribute tasks across servers
- Replaced key-value store with PostgreSQL JSONB resulting in a **10x speed increase**
- Worked with PostgreSQL, using Alembic for migrations and SQLAlchemy for ORM
- Implemented **Linear Optimization** to extract the most critical data for clients

Projects

Lacs Compiler | Scala, MIPS Assembly

- Compiled a subset of the Scala language into MIPS using an Earley parser
- Supported closures, nested functions, first class functions, and type checking
- Included **automatic garbage collection** using Cheney's algorithm

Raytracer 🔗 | C++

- Wrote a **photorealistic graphical renderer** that works by simulating light rays
- Implemented reflections, refractions, and translucency for spheres and planes

Slime Farming Simulator 🔗 | Java

- Developed a **multithreaded server and client** for a rogue-like dungeon crawler
- Incorporated collision detection and double-buffering to reduce screen tearing
- Designed a procedural map generation algorithm and a pathfinding AI

Education

University of Waterloo | *2016 - 2021*

- Candidate for Bachelor of Software Engineering
- Dean's Honour List

Coursera - Stanford University Machine Learning | MATLAB | *2016*

- Implemented Linear & Logistic Regression, ANN, k-NN, and SVM in assignments
- Worked on real world applications such as anomaly detection and recommenders

Awards

- Top 30 Canadian Computing Olympiad Qualifying Round | *2016*
- Platinum Division USA Computing Olympiad | *2016*
- DECA International Team Marketing Finalist | *2014 - 2016*