Alexander Shah

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SKILLS

C/C++ • Python • Scala • SQL • MATLAB • OpenGL

EXPERIENCE

JANE STREET | Software Engineering Intern | OCaml | Winter 2020

CORRELATION ONE | Technical Consultant | 2019

- Developed content for the assessment platform, with a focus on system design and performance.

KHAN ACADEMY | Software Developer Intern | Python, Kotlin, SQL | Summer 2019

- Detected regressions in performance and errors based on aggregated hourly performance logs and alerted teams through interactive Slack messages
- Implemented endpoint to stream mobile performance logs to BigQuery and designed batching protocol to allow for offline data collection

GOOGLE | Software Developer Intern | C++, Python, JavaScript | Fall 2018

- Optimized hit-test submissions by detecting when data is expected to change, improving the total cpu usage time of the Chrome rendering pipeline by 9%
- Designed hit-test visualization and logging tools for Chrome DevTools to allow for developers to see the arrangement, hierarchy, and status of frames
- Connected code review and code searching tools for Chromium during internal hackathon, used by reviewers to jump to the definition of highlighted regions in diffs

SIDEFX | 3D Software Developer Intern | C++, MATLAB | Winter 2018

- Extended the Convex Ridge Separation algorithm for approximate 3D convex decomposition to improve the performance of collision simulations
- Trained an SVM on results from graph cuts over 3D meshes to obtain temporally coherent segments, allowing for the decomposition of animated models
- Traced geodesic paths by following the heat gradient returned from the Geodesics in Heat algorithm

PAVEAI (YC W16) | Software Engineering Intern | Python, JavaScript, SQL | Summer 2017

- Designed a job queue with Celery and Redis to distribute tasks across servers
- Replaced Elasticsearch key-value store with PostgreSQL resulting in a 1000% speed increase and improved reliability

PROJECTS

MOUNTAINSIDE LAIR (PHOTON MAPPING) | C++, Lua

- Wrote an extended ray tracer for the final project of Waterloo's Computer Graphics course (CS 488/688), winning the prize for the top project in Fall 2019.
- Implemented photon mapping, terrain generation, reflection, refraction, adaptive stochastic sampling, bump mapping, multithreading, and ray-intersect-mesh acceleration using K-D Trees

HALITE III (TWO SIGMA AI CHALLENGE) | C++, Python

- Ranked 8th out of 4000+ competitors, 3rd in the university level
- Modelled game states as bipartite graphs and computed the maximum weighted matching to determine move selection

SCALA COMPILER | Scala, Assembly

- Compiled a subset of the Scala language into MIPS Assembly using an Earley Parser
- Implemented closures, nested functions, type checking, tail recursion, and automated garbage collection

EDUCATION

UNIVERSITY OF WATERLOO | Bachelor of Computer Science | 2016 - 2021

- Dean's Honour List, CGPA: 3.95/4.0, Major GPA: 4.0/4.0