Anirudh Prasad

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SKILLS

Languages: C | C++ | Python | Shell Scripting | Assembly
Environments: UNIX/LINUX | AIX | z/OS
Tools and Technologies: LLVM | z/Architecture | Embedded Systems | MATLAB | POSIX | SQL | Git | Docker

EDUCATION

University of Waterloo

Honours Bachelor of Applied Science – Computer Engineering — Graduated Apr '19
Relevant Coursework: Operating Systems, Computer Architecture, Compilers. Distributed Systems

WORK EXPERIENCE

IBM Canada — Markham, ON

Staff Software Developer, Compilers — Feb '21 - Present
Software Developer, Compilers — Jul '19 – Feb '21

- Part of the team porting the LLVM compiler infrastructure to the IBM Z mainframe (z/OS)
- Worked with various internal and external stakeholders to come up with design proposals for adding HLASM support to LLVM, including an RFC to the LLVM community
- Drove the implementation for adding HLASM inline asm support as the primary developer. Worked on adding support for z/OS specific inline asm constraints, HLASM specific instructions and changes to the Core Asm Lexer, Core Asm Parser and Backend Assembler, along with **~90% test coverage**
- Added support to LLVM for other miscellaneous features such as the IBM __ptr32 type qualifier, character set conversions from EBCDIC (z/OS default character encoding) to ASCII/UTF-8 and custom built-in functions
- Setup an end-to-end automation pipeline using **Python, Docker and Buildbots** to measure compiler performance using SPEC benchmarks
- Applied for a **patent** in the area of detecting portability issues in the source code

NVIDIA — Santa Clara, CA

Embedded Systems Software Developer — Sept '18 - Dec '18

- Implemented a C++ publisher/subscriber communications library, supporting both aarch64 and x86_64 architectures, utilizing **C++11 multithreading/concurrency**
- Designed and implemented a service management and orchestration framework in **C++**, to enable **NVIDIA DRIVE (autonomous driving) applications** to coordinate and communicate with each other
- Executed various functional tests on the embedded NVIDIA DRIVE AGX Pegasus hardware platform

Apple — Ottawa, ON

Software Developer – Special Projects Group — Sept '17 - Dec '17

- Ported various functions of the **Newlib pthread library** to work with an **embedded real-time OS** for autonomous systems, with special emphasis on CPU affinity functions

- Implemented a fully functional **core dumping mechanism** in **C** to capture faulting threads and processes and write out core files
- Added automated **LLDB** support using **Python** to debug created core files
- Enhanced various functional tests written for kernel system calls

IBM Canada Markham, ON
Software Developer - Compilers Jan '17 - Apr '17

- Optimized built-in functions in **C** and **C++** for the **POWER9 processor** in a LE Linux environment using compiler optimization strategies
- Wrote several Perl scripts to evaluate POWER9 processor performance using **SPEC Benchmarks**
- Executed functional and performance tests in BE and LE systems

The Nielsen Company Markham, ON
Application Developer May '16 - Aug '16

- Saved around **$700,000 annually** by designing and developing a data extraction application in **C# ASP.NET**, **Ext JS** and **SQL Server** to generate data reports
- Implemented various REST APIs in Ext JS to interact with SQL Server and Oracle SQL Developer
- Improved processing time from **2250+ hours** to **38 hours** by using an external cache to optimize Oracle and SQL queries and stored procedures

PROJECTS

LLVM
https://reviews.llvm.org/p/anirudhp/

- Contributing and reviewing various patches in the LLVM community

Dyslexia Done
https://github.com/aniprasad/online-reading-tutor

- Worked with OnlineReadingTutor to come up with a new mobile application to help combat dyslexia
- Re-designed the UI using React Native and improved lesson delivery by making it more interactive
- Introduced a reward system which included giving virtual badges for achievements
- Conducted beta testing with children and their parents

Smart Voice Assistant
https://github.com/aniprasad/Voice-Assistant

- Voice assistant that uses Microsoft's Speech to Text API to convert speech commands to functional calls
- Used various REST APIs to link voice commands and procure information
- Shows weather and sports information, plays songs, performs navigation and shows places of interests near locations, all controlled by specific voice commands

Music Player
https://github.com/aniprasad/Music-Player-Altera

- Implemented a music player on the Altera Max10 FPGA using C, with play/pause, stop and rewind features
- Gained experience in embedded development, working with NIOS II, Quartus Prime and QSys