

JEFF NIU

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work experience

APPLE

Winter 2019

Intern, Silicon Validation Software (GPU)

- Expanded **GPU hardware coverage** by exercising special GPU blocks and data paths
- Developed shader algorithms to stress GPU memory buses, thrash multilevel caches and validate coherency, drive GPU+SoC power and bandwidth, and stress SoC-level caches
- Participated in F2F discussions with GPU architects and designers to enhance test roadmap
- Developed efficient algorithms to **defeat hardware optimizations** and enhance coverage
- Implemented **Philox 2x3210** PRNG and developed an **O(1) time+memory non-repeating PRNG** based on quadratic residues in **GPU assembly**
- Created a **power virus** that reaches 99% GPU power and bandwidth

COREAVI

Summer 2018

Intern, Embedded Graphics Developer

- Implemented [EGL Compositor](#) Extension in ArgusSC **OpenGL driver**
- Added **VxWorks 6.x/7** real-time process and multi-thread support to Argus
- Developed a generic VxWorks **kernel-mode driver** and added RS-343A support
- Ported Argus **OpenCL** driver to **64-bit** Yocto embedded **Linux**

YAHOO!

Fall 2017

Intern, Software Engineer (Data)

- Contributed data visualizations and SQL/Druid query optimizations to Apache Superset
- Built a [production tool](#) for real-time anomaly detection on Druid streams
- Created [ember-localforage](#), an EmberJS Data adapter that persists to browser cache
- Developed a [Bullet sprout](#) to query in real-time the Twitter Firehose

teams

TEAM WATERLOOP – CANADA’S HYPERLOOP TEAM

Sep 2016

Lead, Software

to Dec 2018

- Created [WLib](#), a collection of C++ libraries optimized for **embedded** systems, including an STL, JSON library, and a **constant-time** memory allocator
- Designed a **fail-safe** software infrastructure based on CAN and distributed hubs
- Developed [Wio](#), a fully-featured build tool and **package manager** for C/C++ supporting native and embedded environments (AVR/ARM) built with **Go**

UW NANO ROBOTICS GROUP

Sep 2016

Technical Lead, Controls

to Apr 2019

- Used **OpenCV** to develop an occupancy grid localization algorithm that tracks the microbot, nearby objects, and walls in C++
- Applied a modified A* procedure and 2D game physics to create a microbot AI that can autonomously push an object through a maze
- Main developer of [Minotaur](#), UWNRG’s controls software built in **Qt**

projects

CERPENT

A Basic C-language interpreter

- Leverages **clang**’s libraries to generate line-by-line ASTs parsed by Cerpent
- Uses LLVM **just-in-time compilation** for run-time functions definitions

FRAKTALS

- Mandelbrot, Julia, and *n*-brot fractal explorer up to 2e+20 magnification
- Hardware accelerated rendering with **Nvidia CUDA** up to 4K resolution

GA TRUSSER

- **Genetic algorithm**-based 2D truss optimizer using **Eigen** and OpenBEAGLE

education

UNIVERSITY OF WATERLOO

B.A.Sc. in Mechatronics Engineering (*Expected Spring 2021*)

GPA 4.0 (Rank 1, 97%)

languages tools

C++, C, GO, JAVA, PYTHON, ARM ASM, JAVASCRIPT, HTML/CSS
GIT, UNIX, VIM, GDB, TMUX, INTELLIJ, ECLIPSE, VISUAL STUDIO