River Gillis

river.codes/

Email : jrivergillis@gmail.com
Mobile : +1-405-837-6435

Programming Skills

- **Languages**: C/C++, Python, JavaScript, Java **Tech**: Node.js, CUDA, OpenCV, OpenGL, React, Redux

Experience

- **Google** Seattle, WA
  Software Engineer III (L4) *October 2020 – Present*
  Software Engineer II (L3) *August 2019 – October 2020*
  - **Streaming Video**: Designed and implemented a system to encode and decode many large image streams in real-time on limited graphics hardware, allowing us to process 3x as much data using 50% fewer resources.
  - **Capture API**: Led the implementation of an easy-to-use C++ API to interface with prototype image capture hardware, accelerating development speed for the team.
  - **Image Processing**: Designed and implemented a pipeline to process and compress RAW camera imagery beautifully and in real-time on consumer hardware using CUDA, Halide, OpenCV, and Intel SIMD.
  - **Tooling Reliability**: Reworked system maintenance and calibration tooling for better reliability and significantly more automation, saving thousands of hours of technician labor per year.
  - **Parallel Processing**: Developed a system to efficiently manage memory and processing across the CPU and many connected GPU devices in parallel.
- **Google** Mountain View, CA
  Software Engineering Intern *Summer 2018*
  - **Daydream**: Worked on the Daydream Virtual Reality Platform team to develop Google's reference implementation for the upcoming OpenXR mixed reality standard.
  - **Efficient Frame Timing**: Used C and C++ within Android's NDK to implement efficient frame timing functionality for head-mounted displays and smartphone AR/VR.
  - **Effective Scheduling**: Developed sophisticated frame rate scheduling algorithms for Daydream's graphics stack that helped prevent motion sickness and ensure smooth visual experiences in Google's headsets.
  - **Contributor**: Contributed changes back to the OpenXR specification used by most leading AR/VR platforms.
- **University of Arkansas** Fayetteville, AR
  Research Assistant – ARteachers.org *Spring 2018*
  - **Teacher Job Matching**: Built and launched a web app that allows teachers searching for jobs to find and apply to positions that match their preferences and accreditations.
  - **Full Stack**: Implemented the app using React to control views, Redux to control state, and Firebase with Cloud Firestore to handle backend tasks and hosting.
- **Google** Mountain View, CA
  Engineering Practicum Intern *Summer 2017*
  - **Network Topologies**: Developed a utility in C++ to expand and manipulate topological entities and associated network traffic under Google's Network Infrastructure Team.
  - **Performance Benchmarking**: Created a benchmarking utility to measure the performance of network traffic engineering solutions at scale, along with a web-based front-end for visualizing the data using BigQuery.
  - **Automation**: Established an automated system for alerting on performance regressions for the team.

Other Projects

- **CHIP-8 Emulator**: Created a multi-threaded CHIP-8 language interpreter, virtual machine, and graphical system emulator capable of running all available software. Accompanied by a blog series that received over 1000 visitors.
- **Flare – Hyperlocal News**: Developed a cross-platform mobile social network with real-time geofencing using React Native, Redux, and Firebase with Cloud Firestore.
- **Permissioned IoT Datastore**: Created a permission-based cloud datastore for connected IoT devices using Node/Express.js and MongoDB, provided as a REST API using Google Cloud Platform.
- **CPUs**: Designed a 5-stage pipelined CPU in VHDL implementing a subset of the MIPS instruction set. Followed up with a synthesized CPU written in Verilog controlled via a bus and finite state machines.

Education

- **University of Arkansas** Fayetteville, AR
  Bachelor of Science in Computer Engineering; "With Highest Distinction"; GPA 3.9/4.0 *Aug 2015 – May 2019*