

# Rice Shelley

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Computer Engineering student specializing in digital electronics, embedded systems, and FPGAs

## EDUCATION

### Auburn University

Bachelors of Computer Engineering; GPA: 3.89

Auburn, AL

Expected May 2021

**Relevant Coursework:** Data Structures, Software Construction, Operating Systems, Digital Electronics, Signals and Systems

## SKILLS

- **Languages:** C++, C, NASM, Verilog, VHDL, Python, Bash, Java, Matlab
- **Technologies:** GCC, Vivado, Git, KiCad, CMake / Make, CentOS, Peta-Linux, Linux, OpenCV, LaTeX

## EXPERIENCE

### GPS and Vehicle Dynamics Lab

Undergrad Researcher

Auburn, AL

September 2018 - Present

- **Low Latency Thermal Image Fusion:** Worked on a low latency thermal image fusion processing system with Xilinx ZCU102 and KCU105 FPGAs. Setup and configured Peta Linux to run on the ZCU102's quad core A53 ARM processor. Wrote user and kernel space drivers in C / C++ to initialize the processing pipeline and control the FPGA defined logic. Implemented drivers for Xilinx IP. Programmed the ZCU102's embedded ARM R5 processing unit to handle a display port driver.
- **Autonomous Forklift:** Worked to digitally map environments of an autonomous forklift using lidar and ROS GMapping. Wrote mapping procedures and a path planning interface for the robot in Python. Maintained the forklift's Linux system by writing various bash scripts to quickly perform necessary procedures.
- **GPS Two Way Time Transfer:** Working to improve synchronization between a network of GPS modules by developing TDCs within an FPGA.

### Starrett Bytewise

Embedded Systems Intern / Consulting Work

Columbus, GA

December 2018 - August 2019

- **Profilometer:** Designed, prototyped, and built a replacement control board for a laser measurement system using a Xilinx Zynq 7000 SoC based development board. Wrote AXI bus IP in Verilog for motor control, and laser measurement sensor processing. Wrote embedded software in C for an ARM Cortex A9 processor that managed HDL defined peripherals, implemented an IP stack, multiple PID loops, and interfaced with legacy VB6 software.

### GMT National Estuarine Research Reserve

Software Engineering Intern

Ponte Vedra Beach, FL

June 2018 - September 2018

- **Interactive Exhibit:** Collaborated with two other interns to write three educational computer games in Java for an interactive exhibit at the Florida State Estuary Educational Centers.

## PROJECTS

- **GrainX:** A 32 bit OS
  - Wrote 32 bit OS in C called GrainX
  - Working memory management with malloc calls
  - Working ATA driver and implementation of ext2 file system
  - PS/2 Keyboard support and VGA color scrolling terminal
- **Soft-core Processor:**
  - Implemented a RiSC-16 ISA in Verilog
  - Implemented GPR file and volatile system memory
  - Wrote assembler in C to convert NASM like syntax to machine code
  - Processor can execute complex programs such as a pong game rendered on a VGA monitor.

## ADDITIONAL EXPERIENCE & ACHIEVEMENTS

- Auburn University Dean's list fall 2018 to present
- IEEE Eta Kappa Nu Member
- Won Tiger Dev 2018 fall semester Game Jam with 32 bit NASM assembly 2D rhythm terminal game
- ACTE State Computer Fair - 1st place 2015 / 2nd place 2018