Joseph Telaak

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EDUCATION

University of South Carolina (USC) — Columbia, SC
BSE in Computer Engineering, Leadership Distinction in Research (Major GPA: 3.88) — *Aug. 2022 – Dec. 2024*

South Carolina Governor's School for Science and Mathematics (SCGSSM) — Hartsville, SC
High School Diploma, Concentration in CS and Math — *Aug. 2020 - May 2022*

EXPERIENCE

USC Systems Research on X Lab — Columbia, SC
Research Assistant — *Feb. 2023 - Dec. 2024*

- Designed a system for contactless prediction of ECG readings and vital signs using mmWave radar.
- Developed and showcased a live demonstration for measuring vital signs without physical contact.
- Published research on generating camera-like 3D bounding boxes exclusively using mmWave radar.
- Engineered a system to integrate multiple standalone mmWave radars into an array structure for enhanced resolution.
- Built ground truth data collection setups supporting multiple projects.

SCGSSM Autonomous Golf Cart Project — Hartsville, SC
Founder, Part-Time Consultant/Instructor — *Jan. 2022 - Feb. 2023, Jan. 2024 - Present*

- Developed a vendor-independent approach for converting golf carts into ADAS-enabled vehicles.
- Designed a custom Nvidia Jetson board for analog-to-digital video capture.
- Implemented computer vision to enable obstacle avoidance, sign recognition, and lane following.
- Established the project as an ongoing course and contributed as a guest instructor.
- Secured funding exceeding $50k with ongoing support from Google and the SC Dept. of Education.

USC Cyberinfrastructure Lab — Columbia, SC
Research Assistant — *Summer 2021*

- Automated equipment configuration, throughput testing, and packet loss measurements in networks.
- Developed a on-switch server load balancer in P4.

LEADERSHIP

SCGSSM Board of Directors — Hartsville, SC
Alumni Association Engagement Committee — *Jul. 2023 - Present*

FIRST Robotics — Columbia, SC
FIRST Technical Advisor, Judge, Robot Inspector — *Jan. 2022 - Present*

SELECTED PROJECTS

- **RISC-V CPU**: Designed a custom multicore RISC-V CPU with a matrix coprocessor and dedicated peripherials for PWM, SPI, and I2C. Implemented on Altera FPGA.
- **Rocket Flight Computer**: Arduino flight computer with GPS, IMU, barometer, and LoRA telemetry on custom PCB.
- **Pick-n-Place Machine**: Built a machine for automated PCB assembly using Marlin and OpenPNP.

SKILLS

- **Languages**: : C/C++, Python, Java, MATLAB, Rust, LUA, P4, Verilog, SQL, MIPS, x86 Assembly
- **Programs**: : mmWave Studio, Quartus, STM32 Cube, Altium, AutoCAD
- **Technologies**: : ROS, RTOS, Kubernetes, RF Design, Signal Processing, 3D Printing
- **Memberships**: : IEEE Eta Kappa Nu (HKN), IEEE MTTS, IEEE, ACM, AIAA