Joseph Telaak

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Education

- **University of South Carolina (USC)** — Columbia, SC
  BSE in Computer Engineering, Leadership Distinction in Research (GPA: 3.58); — *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 SyReX Lab** — Columbia, SC
  Research Assistant — *Feb. 2023 - Present*
  - Created a system for contactless prediction of ECG readings and vitals using mmWave radar.
  - Developed and presented a live demonstration of contactless vital sign measurement.
  - Published work on generating camera-like 3D bounding boxes using only mmWave radar.
  - Designed a system to combine standalone mmWave radars into a larger array structure to increase resolution.
  - Constructed the ground truth data collection setups for several projects.
- **SCGSSM Autonomous Golf Cart Research** — Hartsville, SC
  Founder, Part-Time Consultant/Instructor — *Jan. 2022 - Feb. 2023, Jan. 2024 - Present*
  - Converted standard golf carts to ADAS-enabled vehicles that operate in a V2V networked system.
  - Turned project into an ongoing course and served as a guest instructor.
  - Managed funding (>$50k) during the initial phase of the project and secured ongoing support.
- **USC Cyberinfrastructure Lab** — Columbia, SC
  Research Assistant — *Summer 2021*
  - Automated throughput and packet loss measurements in both real and simulated networks.
  - Developed a on-switch server load balancer in P4.

Volunteering

- **SCGSSM Board of Directors** — Hartsville, SC
  Alumni Association Board Member, Engagement Committee — *Jul. 2023 - Present*
- **FIRST Robotics** — Columbia, SC
  FIRST Technical Advisor — *Jan. 2022 - Present*

Selected Projects

- **Self-Driving Golf Cart**: Designed vendor-independent ADAS system for golf carts. Custom Nvidia Jetson board with analog to digital video capture. Computer vision for obstacle avoidance, sign recognition, and lane following.
- **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.

Other

- **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, IEEE MTTS, IEEE, ACM, AIAA