Joseph Telaak

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EDUCATION

University of South Carolina — Columbia, SC

BSE in Computer Engineering, Leadership Distinction in Research (GPA: 3.61) — *Aug. 2022 – Dec. 2024*

EXPERIENCE

Product Manager — Dec. 2024 - Present

Parkeze — *Columbia, SC*

- Led end-to-end development of ultra-low-power IoT parking sensors, from concept to market launch.
- Architected cloud-native backend infrastructure supporting real-time data streaming to 1000+ users.
- Optimized sensor hardware and firmware achieving 50% power reduction and 120% cost savings.
- Built comprehensive analytics platform using React and Flask for real-time sensor performance monitoring.
- Developed custom Debian distribution for LoRaWAN gateways to reduce deployment time.

Research Assistant — Feb. 2023 - Dec. 2024

USC Systems Research on X Lab — *Columbia, SC*

- Co-authored research on novel mmWave radar algorithms for 3D vehicle and pedestrian detection.
- Secured research funding through competitive grant proposals.
- Developed contactless vital sign monitoring system.
- Designed data collection infrastructure supporting multiple research projects.

Project Lead — Jan. 2022 - Feb. 2023, Jan. 2024 - May 2024

SCGSSM Autonomous Golf Cart — *Hartsville, SC*

- Transformed a legacy golf cart into an autonomous vehicle platform for research.
- Engineered networked interface module enabling software control of legacy analog vehicle systems.
- Designed custom Nvidia Jetson carrier board with multi-channel analog-to-digital video capture capabilities.
- Implemented computer vision pipeline for obstacle detection, traffic sign recognition, and lane tracking.
- Mentored 20+ students and established ongoing curriculum for autonomous systems development.

Research Assistant — Summer 2021

USC Cyberinfrastructure Lab — *Columbia, SC*

- Automated equipment configuration, throughput testing, and packet loss measurements in networks.
- Created an on-switch webserver load balancer in P4.

LEADERSHIP

SCGSSM Board of Directors — Hartsville, SC

Alumni Association Engagement Committee Member — *Jul. 2023 - Present*

FIRST Robotics — Columbia, SC

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

SELECTED PROJECTS

PiSwitch: Created a 7-port router/network switch with custom controller, web UI, and OOB management.

LLM Voice Assistant: Designed a far-field mic array with XVF DSP, Zephyr on i.MXRT, ESP32 Wi-Fi NIC, OTA for all 3 major chips, and real-time audio streaming to a LLM pipeline.

Agentic Audio Streamer: Developed a multi-room audio streaming system using an ADAU DSP, DACs, and Raspberry Pi CM5. Integrated Spotify Connect and enabled external control via a custom API for LLMs.

RISC CPU: Implemented a parallelized RISC CPU with GPIO on an FPGA.

Pick-n-Place Machine: Designed and built a desktop PCB assembler running Marlin and OpenPNP.

SKILLS

Software: C/C++, Python, Java, MATLAB, Rust, LUA

Tooling: Altium, KiCad, Quartus, STM32 Cube, MXUExpresso, mmWave Studio

Embedded: Zephyr, Yocto, Buildroot

Memberships: IEEE Eta Kappa Nu (HKN), IEEE MTTS, IEEE, ACM, AIAA