Joseph Telaak

https://linkedin.com/in/jtelaak/

Email : jtelaak@sc.edu
Mobile : 704-351-7396

Education

University of South Carolina — Columbia, SC
B.S.E. in Computer Engineering; ***GPA: 3.61, Major GPA: 3.88*** — *Aug 2022 – Dec 2024*

Research Experience

USC SyReX Lab — Columbia, SC
Undergraduate Research Assistant — *Feb 2023 – May 2024*

- Collaborated with Dr. Sanjib Sur on millimeter-wave radar systems research.
- Co-authored research on generating camera-like 3D bounding boxes using only mmWave radar.
- Collected and synchronized training data for vehicle detection using radar, LiDAR, and camera sensors.
- Developed a demo comparing radar-based vital sign detection with optical heart rate sensors.
- Contributed to the design of a system for contactless prediction of ECG readings and vital signs using mmWave radar.
- Optimized software for efficient radar data transfer to computers.
- Designed and built data collection setups for multiple research projects.

SCGSSM Autonomous Golf Cart — Hartsville, SC
Student Researcher, Consultant/Instructor — *Jan 2022 – May 2022, Jan 2023 – May 2024*

- Piloted a new engineering projects course with Dr. Elaine Parshall, successfully adding it to the course catalog.
- Developed a vendor-neutral retrofit for golf carts enabling drive-by-wire and ADAS while retaining manual controls.
- Designed a custom Nvidia Jetson carrier board and PCB for hardware control.
- Implemented LiDAR and camera-based object detection, obstacle avoidance, sign recognition, and lane following.
- Secured over $50,000 in project funding with ongoing support from Google and the SC Dept. of Education.
- Consulted on ongoing project development and planning for a student-implemented fleet management system.

USC Cyberinfrastructure Lab — Columbia, SC
Summer Research Intern — *Jun 2021 – Jul 2021*

- Worked with Dr. Jorge Crichigno as a high school summer intern.
- Developed P4 applications, including an on-switch web server load balancer, and automated network testing scripts.
- Presented at the 2021 SPRI Poster Session and at the GSSM 33rd Annual Research Colloquium.

Conference Publications

C2 Hem Regmi, Reza Tavasoli, Joseph Telaak, Sanjib Sur, Srihari Nelakuditi, AutoSense: Reliable 3D Bounding Box Prediction for Vehicles, ACM MobiSys 2024 Poster, June 2024

C1 Joseph Telaak, Wout De Backer, Designing an Arduino-based Rocket Flight Computer for Embedded Systems Education, AIAA Region II Student Conference, Mar 2023

Posters

P1 Joseph Telaak, Elie Kfoury, Jose Gomez, Ali AlSabeh, Shahrin Sharif, Jorge Crichigno, Developing Applications for Programmable Protocol-Independent Packet Processors (P4) to Increase Network and Data Center Efficiency, SPRI 2021 Poster Session, July 2021

Relevant Coursework

Graduate-level:
CSCE 790 (Wireless and Mobile Systems for IoT)
CSCE 750 (Analysis of Algorithms)
CSCE 611 (Advanced Digital Design)
CSCE 513 (Computer Architecture)
MATH 544 (Linear Algebra)
MATH 574 (Discrete Mathematics)

Undergraduate:
CSCE 313 (Embedded Systems)
CSCE 311 (Operating Systems)
CSCE 274 (Robotics)

Industry Experience

Parkeze Columbia, SC

Product Manager - Sensing Solutions *Dec. 2024 – Present*

- Collaborating with USC to pilot a smart parking initiative, overseeing test planning and deployment.
- Designed and developed ultra low-power parking sensors and custom network gateways for scalable deployment.
- Developed robust vehicle detection using magnetometer sensors and signal processing.
- Streamlined the LoRaWAN stack to transmit sensor state directly, eliminating LNS dependencies and reducing overhead.
- Engineered Redis-based caching and pub/sub systems for low-latency delivery of sensor state and metadata.
- Implemented geospatial queries and automated data warehousing for real-time parking search and efficient retention.
- Architected a high-performance backend, significantly reducing network overhead and system latency.

Selected Projects

Custom Nvidia Jetson Carrier Board

- Designed a compact carrier board for the Nvidia Jetson platform with analog video capture and an onboard network switch, enabling edge AI video processing.

RISC-V CPU

- Implemented a RISC-V CPU with custom matrix operations and dedicated SPI peripherals on an FPGA, expanding on a class project.

Automated Pick-and-Place Machine

- Designed an automated PCB assembler integrating a custom Marlin control board and OpenPnP for rapid, precise component placement.

FPGA-Based Batch Programming Jig

- Engineered a batch programming and test jig using an FPGA to multiplex debug connections, enabling automated, parallel programming and verification of multiple PCBs for efficient hardware validation.

Service

SCGSSM Board of Directors Hartsville, SC

Alumni Association Engagement Committee *Jul. 2023 – Present*

- Alumni engagement, awards and events planning.

FIRST Robotics Columbia, SC

FIRST Technical Advisor Assistant (FTAA), Judge, Robot Inspector *Jan. 2022 – Present*

- Served as FTAA for FRC, ensuring event integrity and managing field operations as an official FIRST representative.
- Selected to train as lead FTA for SC FTC events, supporting event technology and guiding teams and volunteers.
- Mentored top SC teams, supporting technical excellence and team development.
- Volunteered as Judge and Robot Inspector, ensuring compliance and a fair environment.
- Interviewed teams and helped select award winners as a Judge.

Awards

USC Dean's List x4 *Fall 2022 - Fall 2023*

USC President's List x1 *Fall 2022*

Grants and Scholarships

ACCESS Travel Grant - AeroConf 2025 ($3,500) *Fall 2024*

ACCESS Travel Grant - SC23 ($2,000) *Fall 2023*

HackMIT Travel Grant ($2,000) *Fall 2023*

USC REU x5 (~$4,000 ea) *Spring 2023 – Spring 2024*

USC Dean's Scholarship ($3,000/year) *Fall 2022*

USC Palmetto Fellows ($10,000/year) *Fall 2022 – Spring 2024*

Google AI Development Grant ($10,000) *Spring 2022*

Technical Skills

Programming: C, C++, Java, Python, MATLAB, R, MySQL, VHDL

Technologies: ROS, RTOS, LoRaWAN, mmWave Studio, Intel Quartus, STM32Cube

Developer Tools: Docker, Kubernetes, Redis, Kafka, Altium, KiCad