Joseph Telaak

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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 and video capture
- 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 webserver load balancer, and automated network testing scripts
- Presented at the 2021 SPRI Poster Session and at the GSSM 33rd Annual Research Colloquium

Professional 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.

Skills

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

Technologies: ROS, RTOS, LoRaWAN, mmWave Studio, Intel Quartus, STM32 Cube

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

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)

Organizations

IEEE Eta Kappa Nu Honor Society (*IEEE HKN*)

Institute of Electrical and Electronics Engineers (*IEEE*)

American Institute of Aeronautics and Astronautics (*AIAA*)

Assoication for Computing Machinery (*ACM*)

Awards

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

USC President's List x1 — *Fall 2022*

Grants and Scholarships

USC REU x5 — *Spring 2023 – Spring 2024*

USC Dean's Scholarship — *Fall 2022*

USC Palmetto Fellows — *Fall 2022 – Spring 2024*

Google AI Grant — *Spring 2022*

Conferences

SC23 Supercomputing Conference, *Denver, CO* — *Nov 12-17, 2023*

HackMIT Hackathon, *Cambridge, MA* — *Sept 16-17, 2023*

USC CSE Research Symposium, *Columbia, SC* — *Apr 14, 2023*

AIAA Reigon 2 Student Conference, *Knoxville, TN* — *Mar 26-28, 2023*

GSSM 34th Annual Research Colloquium, *Hartsville, SC* — *Nov 17, 2022*

GSSM 33rd Annual Research Colloquium, *Hartsville, SC* — *Oct 22, 2021*

SPRI 2021 Poster Session, *Columbia, SC* — *July 16, 2021*

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 2 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