DANIEL SZUREK

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Tuscaloosa, AL, USA

EDUCATION

The University of Alabama **August 2022 - December 2026**
Master of Science & Bachelor of Science in Computer Science *GPA: 3.88*
Minor in Mathematics, Accelerated Masters Program, Honors College

PROFESSIONAL EXPERIENCE

The University of Alabama EcoCAR **Tuscaloosa, AL, USA**
Connected and Automated Vehicle (CAV) Lead *September 2025 - Present*
- Architecting the autonomous navigation stack for a pre-production Cadillac Lyriq, integrating Lane Centering, Cooperative Adaptive Cruise Control, and V2X connectivity for a robust Advanced Driver Assistance System (ADAS)
- Developing Model Predictive Control (MPC) and PID algorithms in Simulink and MATLAB to govern vehicle lateral and longitudinal control systems
- Implementing a global nearest neighbor (GNN)-based sensor fusion algorithm for processing real-time data from camera and radar systems
- Incorporating all algorithm input and output into the stock Controller Area Network (CAN) bus communication, integrating with stock GM cybersecurity protocols for command validation and signal integrity
- Deployed driver assistance models onto dSPACE Autera embedded computer, optimizing runtime performance for real-time inference
- Researching gaussian processes, MPCs, and reinforcement learning for autonomous systems

Voice Assistant Project Lead *September 2024 - August 2025*
- Engineered a custom voice assistant with LangChain, Ollama, and PyTorch to control vehicle infotainment functions, running natively on an NXP NavQ+ (Linux) embedded computer
- Implemented Natural Language Processing (NLP) models to interpret driver commands and execute hardware interrupts via Python scripts
- Led an engineering team of five students in developing the feature

User Experience Team Member *August 2022 - August 2024*
- Developed a custom automotive navigation application using Flutter, featuring real-time GPS routing, location search, and ETA calculation
- Designed the application architecture to run on an Android-based infotainment system

SSAB **Mobile, AL, USA**
Data Science Intern *June 2025 - August 2025*
- Engineered automated ETL pipelines using Azure Data Factory and SQL to process large-scale manufacturing datasets.
- Designed and implemented a project portfolio dashboard in Power BI, automating quarterly financial reporting
- Built and deployed cost-comparison solutions in Tableau, facilitating data-driven financial decision-making
- Built dynamic production capacity models using Power BI, enabling leadership to define optimal targets based on live sensor data.
- Led presentations for senior managers and hosted international meetings with colleagues in Sweden and Finland

Brasfield & Gorrie L.L.C **Birmingham, AL, USA**
Process Development Intern *May 2024 - January 2025*
- Developed a Full-Stack internal application for claim management, migrating legacy Excel workflows to a modern web architecture
- Built automated reporting pipelines using Azure Databricks, significantly reducing manual data entry overhead and improving compliance auditing
- Designed and implemented RESTful API integrations connecting Trello with internal ticketing systems, automating IT support workflows

PROJECTS

Voice Assistant for Vehicle Control *Link to Project*
- Led a team of 5 students to develop an LLM-based voice assistant running natively on NXP NavQ+ companion computer
- Demonstrates early generative AI experience with optimized inference for edge computing

Super-Resolution Facial Recognition Pipeline *Link to Project*
- Developed a custom Convolutional Neural Network (CNN) pipeline to perform facial recognition on low-resolution inputs
- Implemented a Deep Super-Resolution (DSR) model to upscale images before feeding them into a quantized EdgeFace model, improving accuracy on degraded inputs
- Applied model quantization techniques to reduce model size for efficient deployment without significant accuracy loss

Vehicle Maps Application *Link to Project*
- Singlehandedly developed a complete maps and navigation system for vehicle infotainment using Flutter
- Features GPS integration, route generation algorithms, location searching with autocomplete, and accurate route time estimation
- Deployed to Android system running in competition vehicle

TECHNICAL SKILLS

Programming Languages: Python, C++, C, MATLAB, SQL, JavaScript (React), Dart (Flutter), Java, Swift
AI & Robotics: ROS 2, Model Predictive Control (MPC), Computer Vision (CNNs), Sensor Fusion, Simulink, RTMaps, Gaussian Processes, Reinforcement Learning, PyTorch, LangChain, LLM Integration, Edge AI
Cloud & DevOps: Azure (Data Factory, Databricks), Docker, Git, Linux (Ubuntu), CI/CD Pipelines
Web & Mobile: Full-Stack Development, REST APIs, Flutter, React, Backend Engineering, Frontend Engineering, UI