# Andrew Mikhail

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## EDUCATION

*August 2012 – June 2017*

**University of California, Santa Cruz**
Bachelor of Science in Bioengineering with a concentration in Bioelectronics
Minor in Computer Engineering
Cumulative GPA: 3.81
University Dean's Honors Recipient
Baskin School of Engineering Dean's Award Recipient
Huffman Prize Winner
David S. Lee Scholarship Recipient

## DISTINGUISHABLE SKILLS

- **Programming Expertise:** Extensive experience programming using C, C++, CUDA, and Python languages.
- **Compute Platform Design:** Accomplished in designing system-level solutions to complex engineering problems in a safety-critical domain using both hardware and software.
    - ➢ Knowledgeable in AI deployment with experience in shipping models developed with common machine learning frameworks (PyTorch, TensorFlow, ONNX) into production environments to use CPU, NPU, or GPU acceleration.
    - ➢ Knowledgeable in optimizing infrastructure for scalability and performance; utilizing system monitoring and logging solutions.
- **Transport and Interface Protocols:** Diverse networking experience using transport layer protocols such as UDP, TCP as well as application layer protocols such as DDS, NTP, WebSockets, and HTTP. Experienced in interfacing with devices via protocols such as CAN, CANFD, UART, I2C, and PCIe**.**
- **Real-time Communication:** Proficient in using and tuning DDS (Data Distribution Service) for real-time inter-process, inter-thread, and inter-processor communication.
- **Cloud Platforms:** Experienced with industry standard cloud platforms (AWS), data storage and caching (Postgres), and web services for data access (REST).
- **Model-Based Design:** Acquainted with Model-based design and test using MATLAB Simulink to enable controls systems.
- **Infrastructure as Code**: Familiar with IaC tools such as Docker, Packer, and Vagrant for automated deployment and provisioning.

## EXPERIENCE / EMPLOYMENT HISTORY

*December 2023 – Present*

**Staff Software Engineer, Infrastructure, Autonomy**
Rivian Automotive

- Led the Technical Team in Developing AI Deployment Infrastructure:
    - o Spearheaded a technical team developing middleware for acceleration on heterogeneous hardware, optimizing on-board and off-board autonomy compute use cases.
    - o Achieved upwards of a 60% improvement in processing latency over previous generation, resulting in enhanced real-time decision-making for autonomous systems.
- Led the Technical Team in Developing Data Logging Infrastructure:
    - o Orchestrated the development of robust data logging infrastructure to harness data for autonomy feature enhancement and reliability improvement.
    - o Enabled the analysis of hundreds of GB data daily, facilitating data-driven insights that directly influenced feature enhancements and system reliability.
- Led the Design and Implementation of Runtime High-Availability Infrastructure:
    - o Architected and implemented runtime infrastructure, ensuring availability of critical compute resources, minimizing hardware contention, and guaranteeing deterministic scheduling of software components.
    - o Achieved an 80% reduction in bugs reported due to irregular system behavior, significantly enhancing the stability of autonomous systems.

*December 2022 – December 2023*

**Staff Software Architect, Self Driving**
Rivian Automotive

- Led the Design & Development of AI Deployment Infrastructure:
  - Designed middleware based on graph concepts for data I/O handling, orchestration, and pipelining to develop and deploy AI applications.
  - Designed middleware with extensibility for integrating frameworks such as PyTorch, OpenCL, NvMedia, CUDA, and TensorRT.
- Led the Development of Data Logging Infrastructure:
  - Implemented a multimodal application for logging raw sensor measurements, intermediate data, as well as autonomy stack outputs over multiple interfaces: CAN, UDP, TCP, and DDS.
  - Implemented data tooling to enable internal teams to operate on and transform data collected.
  - Migrated all software within data logging project from CMake to Bazel build system.

*April 2021 – December 2022*

**Senior Software Architect, Self Driving**
Rivian Automotive

- Designed next-generation software architectures achieving: reduced software complexity, improved system maintainability, and software portability across platforms.
- Defined End-to-End Data Pipeline for Vehicle ML Platform: encompassing model export format, algorithm selection, software allocation to compute engines, and data logging mechanisms.
- Defined domain budgets based on system perception to actuation targets, aligning development efforts with precise objectives while optimizing resource allocation.
- Spear-headed triage, troubleshooting, and patching of high visibility, high-impact bugs in autonomy stack, leading to 50% increase in ADAS feature availability.

*July 2020 – April 2021*

**Software Engineer IV, Self Driving**
Rivian Automotive

- Owned all software activities for the driver monitoring subsystem including: requirements gathering, maintenance of Yocto project, integration of neural network, and implementation of runtime applications.
- Developed user-space ISO-26262 compliant applications integrating software components from internal algorithm teams to enable ADAS features.
- Implemented diagnostics application and maintained ECU diagnostics stack based on ISO-14229 spec for Unified Diagnostics Service (UDS).
- Implemented onboard infrastructure for vehicle to cloud communication and consumption of GNSS corrections.
- Implemented NTP client and server based on RFC-4330 for system time synchronization of Linux/QNX/SafeRTOS-based ECUs within ADAS domain.
- Developed wrapper libraries for inter-thread, inter-process, and inter-ECU communication using POSIX IPC primitives and DDS.
- Implemented software security libraries utilizing MbedTLS for provisioning and usage of symmetric & asymmetric keys to enable features such as secure OTA, secure communications, and secure diagnostics.

*January 2020 – July 2020*

**Software Systems Architect**
Bay Systems Consulting at NASA Ames Research Center

- Led software system design, architecture, and implementation for deployment on various processors for Starling Mission.
- Developed and managed functional software and system requirements as per NASA NPR 7152.2.
- Developed test plans to ensure functional and system requirements are met.
- Developed and maintained mission-critical software within cFE/cFS middleware for use on embedded Linux CPU.
- Implemented Simulink model and test harnesses for spacecraft propulsion algorithm.
- Maintained software definitions in PostgreSQL database and developed tools for software code auto-generation and rapid-prototyping.
- Managed trade studies on new technologies to increase cost effectiveness, flexibility, and/or technical readiness.