

ERIC LUJAN

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EXPERIENCE

Staff Applied Scientist · Cruise

April 2024 - Present

- Helped set the technical direction for Cruise's company-wide functional safety testing methods and human benchmarks. Represented the Simulation and Testing department in initiatives with Autonomy and Systems Engineering leads to build testing workflows that were run thousands of times per week by hundreds of model developers.
- Led verification and validation for construction zones, emergency scenes, and road closures. Built automated data mining and scenario creation pipelines, expanded synthetic testing and training datasets, and delivered large scale test suites for measuring the AV's performance in long-tail driving situations. Co-authored some of Cruise's first capability validation reports, which were the primary inputs to launch readiness and ODD expansion decisions by company executives.
- Developed tools to improve Cruise's ability to create realistic sensor simulations in a fully synthetic environment. Built an ML-based tool in the Unreal Engine to give real-time feedback on the visual fidelity of 3D assets and animations to technical artists, reducing delivery time by 40x. Constructed a proof-of-concept for city-scale mesh reconstruction of the world environment using sensor fusion, semantic segmentation models, and geometric operations in Houdini.

Senior ML/Robotics Engineer II · Cruise

April 2024 - Present

- Led a cross-functional working group spanning planning, prediction, computer vision, perception, simulation, and systems engineering teams to deliver end-to-end capabilities for complex interactions and autonomous navigation around construction zones, school buses, emergency vehicles, and humans controlling traffic.
- Designed and implemented enhancements to the AV's onboard decision-making software, including adding intersection-related features to Cruise's ML-based trajectory selection model and training data generation pipelines, significantly improving AV performance at red lights, unprotected turns, and crosswalks.
- Engineered foundational architectural components for Cruise's AV planning stack, including a universal API for specifying and optimizing between mission goals and behavioral parameters, which was adopted by capabilities including trip pullovers, emergency responder interactions, and degraded state handling. Built a unified maneuver logic middleware layer that replaced thousands of lines of fragmented and error-prone legacy code with stable, well-understood, and extendable C++ libraries.

Engineering Manager · Cruise

November 2017 - June 2020

- Managed Cruise's Behaviors team within the Planning and Controls (P&C) department, owning the AV's decision-making logic across all maneuvers, including intersections, lane changes, VRU interactions, and nominal driving, as well as interfaces with vision, prediction, routing, mapping, and controls components.
- Led a series of complex cross-team initiatives to add new fundamental capabilities and implement all maneuvers in Cruise's next-generation probabilistic trajectory planner/prediction engine, which unlocked new behaviors and a massive scaling of Cruise's ODD and fleet. Directly responsible for creating a deployment roadmap, reviewing and contributing to design proposals, and managing dependencies with partner teams.
- Cultivated a high-performing, sustainable engineering culture by delivering under time pressure while focusing on software quality, maintainability, and safety. Provided technical and career mentorship to engineers and university interns. Played a key role in recruiting and retaining top talent during a period of over 3x headcount growth.

Software Engineer · Cruise

October 2016 - November 2017

- Developed new AV behavioral capabilities on the P&C team and grew to be the owner of Cruise's intersection behavior stack. Owned robotics software components relating to traffic-light intersections, all-way stops, crosswalks, and unprotected turns.
- Built Cruise's first solver for selecting optimal gaps in oncoming traffic, using a spatio-temporal lattice search considering potential collisions and the AV's kinematics, which drastically improved Cruise's disengagement rate and safety performance in unprotected left turns.

Engineering Intern · Cruise

January 2016, September 2016

- Retrofitted vehicles with sensors and built Cruise's first in-vehicle Android application for engaging the AV and displaying system status to passengers. This was featured in demo rides to GM executives that led to Cruise's acquisition at a \$1B valuation.

Undergraduate Researcher · Singapore University of Technology and Design (SUTD)

May 2016 - August 2016

- Studied and implemented language models for text synthesis and embedding tasks using Keras, TensorFlow, and NLTK.

PUBLICATIONS

Inventor on 15 U.S. patents regarding autonomous vehicle technology (6 granted; 9 pending).

EDUCATION

Massachusetts Institute of Technology (MIT)

2015-2016

Candidate for S.B. in Electrical Engineering and Computer Science; Currently on leave of absence to work in industry.

PROGRAMMING LANGUAGES

Primary: C++, Python. **Some Experience:** JavaScript/TypeScript, Go, Ruby, C, Java, SQL.