CURRICULUM VITAE

KAILANI P. ALARCON

University of Nevada, Reno
Graduate Study, Electrical Engineering
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EDUCATION:

Fall 2026 - Present **University of Nevada, Reno | Graduate Study in Electrical Engineering**
Graduate coursework in progress: Independent Study in Control Systems (EE 793E), Principles of Computer Operating Systems (CS 646), and Game Theory for Cybersecurity (CS 703).
Spring 2027 registered coursework (upcoming): CS 685 Computer Vision; CS 687 Fundamentals of Deep Learning; EE 672 Digital Control Engineering.

Aug 2026 **University of Nevada, Reno | B.S. in Electrical Engineering**
Emphasis: Robotics, Autonomous/Aerial Vehicles, and Embedded Systems; Minor in Mathematics; Honors Baccalaureate (conferred August 2026).
Selected coursework: Control Systems I and II, Introduction to Robotics, Signals and Systems, Digital Signal Processing, Linear Algebra, Probability and Statistics, Embedded Systems Design, and Microprocessor Applications.

RESEARCH FOCUS

Research interests: Reliable robotic manipulation for space operations under degraded vision and variable contact, emphasizing sensor fusion, state estimation, and adaptive impedance control for safe task execution.

RESEARCH EXPERIENCE:

Aug 2026 - Present **NASA Marshall Space Flight Center | Office of STEM Engagement (OSTEM) Intern**
Human Factors Engineering and Mechanical Design | Technical mentor: Elizabeth (Liz) Bowman-Langley | Huntsville, AL
Independently evaluated a robotic arm for proposed lunar-dust mitigation tests in high vacuum, analyzing geometry, joint travel, reachable workspace, loading, and actuator compatibility.
Calculated an estimated 3.1 N·m shoulder self-load moment for a horizontal arm configuration; identified excluded rocker and actuator masses requiring further center-of-gravity analysis before actuator selection.
Developed 34 hierarchical system requirements from six operating scenarios addressing manipulation, vacuum compatibility, workspace constraints, emergency shutdown, and verification.
Developed preliminary control software and atmospheric bench-test procedures for the existing Pololu Micro Maestro 6-channel controller; documented verification needs for proposed vacuum-compatible actuators.

Jan - May 2025 **University of Nevada, Reno | Three-Link Human-Leg Dynamics**
Honors Signature Experience | Faculty mentor: Dr. Sesh Commuri | Student-initiated, faculty-mentored research
Developed a MATLAB Level-2 S-function for a planar three-link leg model in Simulink; computed foot position, Cartesian velocity, and approximate joint torques from hip, knee, and ankle states.
Implemented forward kinematics and Jacobian velocity mapping; formulated an inertia matrix and used Coriolis/centrifugal and gravitational terms in simplified joint-torque calculations.

Jan - May 2025 **University of Nevada, Reno | Virtual Vector Network Analyzer for Stepped-Frequency Radar**
EE 330 Honors Contract / Honors Signature Experience | Faculty mentor: Dr. Jihwan Yoon | Student-initiated project
Developed a MATLAB-based two-port virtual vector network analyzer (VNA) workflow for stepped-frequency continuous-wave (SFCW) radar, with 236 measurement points from 100 MHz to 6 GHz.
Implemented 12-term short-open-load-through (SOLT) calibration, corrected-versus-uncorrected S-parameter visualization, and automated Touchstone (.s2p) exports.

TECHNICAL PUBLICATIONS AND PRESENTATIONS:

Industry White Papers

1. Alarcon, K. P. (2026, February 5). *Thermal Validation of Commercial LED Luminaires*. LUX Dynamics.
2. Alarcon, K. P. (2026, March 10). *Understanding Optical Lens Performance in LED Luminaires*. LUX Dynamics.

Posters

1. IVerify: Noninvasive IV Occlusion Detection System. Poster presented at Innovation Day, May 2026. Senior capstone design and preliminary validation.
2. Designing LEGO: Environmental Sustainability and Engineering Design Review. Poster presented at the ENGR 301 Poster Session, University of Nevada, Reno, May 2025.

SELECTED ENGINEERING PROJECTS:

Spring 2026 — **IVerify: Noninvasive IV Occlusion Detector | Senior Capstone**

Project and systems integration lead for a four-person team. Coordinated system architecture, requirements, integration, and documentation across the clamp, force sensor, analog front end, microcontroller, and indicator subsystems.

Integrated a proof-of-concept bench prototype with repeatable force-response sensing, approximately 5 N clamp preload, and two-LED status indication; organized requirements-to-test traceability.

Spring 2026 — **UR3e Robot Kinematics | Robotics Team Project**

Modeled robot kinematics using Denavit-Hartenberg transforms, MATLAB Jacobians, and singularity analysis; evaluated a configuration with Jacobian rank five.

2026 — **HueMotion: Camera-Based Gesture Control | LUX Dynamics**

Developed a real-time MediaPipe hand-tracking interface using gesture stabilization and two-hand recognition to trigger RGBW lighting scenes; extended control from wired DMX hardware to wireless Casambi API scene activation.

Fall 2025 — **Fingerprint-Based Authentication | Embedded Systems Team Project**

Designed and integrated an STM32 fingerprint authentication prototype in a four-person team, using UART sensor communication, enrollment and identification of 24 templates, packet handling, and status indicators.

PROFESSIONAL EXPERIENCE:

Sep 2023 - Aug 2026 — **LUX Dynamics | Product Development Intern**

Reno, NV

Conducted electrical, thermal, and photometric evaluations for more than 12 LED products, informing product-validation and manufacturing-release decisions.

Independently developed a team-adopted Python/Arduino thermal-validation workflow with eight Pico TC-08 thermocouple channels, programmable setpoints, heater control, stability checks, and automated reporting.

Developed a tablet-based RGBW lighting quality-control interface using Arduino Mega and DMX512; authored two publicly available LUX Dynamics technical white papers.

Aug 2020 - Aug 2023 — **Sonic Drive-In | Associate Manager**

Reno-Sparks, NV

Managed daily operations, training, scheduling, and compliance while pursuing engineering studies.

TEACHING, MENTORING AND OUTREACH:

Aug 2024 - May 2026 **Engineering Peer Tutor | University of Nevada, Reno**
Engineering Study Hub / Engineering Tutoring Center
Tutored approximately 12 to 15 engineering students weekly in circuits, signals, controls, embedded C, STM32 microcontrollers, MATLAB, and Simulink.

Nov 2024 - May 2025 **Teacher Assistant Intern | University of Nevada, Reno**
Academic Support Program
Assisted with grading, academic support, course logistics, and communication among students, mentors, and program leadership.

May - Aug 2025 **E-FIT Mentor | University of Nevada, Reno**
Academic Support Program
Guided incoming engineering students during university transition activities.

May - Aug 2025 **Honors College Ambassador | University of Nevada, Reno**
Honors College Outreach
Assisted with campus tours, recruitment events, and student orientation.

AWARDS, HONORS AND SCHOLARSHIPS:

Aug 2026 **Honors Baccalaureate, University of Nevada, Reno**

May 2026 **Outstanding Service Award, College of Engineering**

May 2026 **Outstanding Service Award, Department of Electrical Engineering**

May 2026 **Innovation Day Finalist, IVerify Senior Capstone Team**

Jan 2026 **TC Energy Scholarship**

May 2025 **Honors College Global Travel Award**

Aug 2022 **Presidential Scholarship, University of Nevada, Reno**

INTERNATIONAL ACADEMIC EXPERIENCE:

May - Jul 2024 **Università degli Studi della Tuscia | Honors Abroad with USAC, Italy**
Coursework: Italian language, photography, and art crime (USAC Honors Abroad).

TECHNICAL SKILLS:

Robotics and controls: MATLAB, Simulink, robot kinematics and Jacobians, rigid-body dynamics, PID and lead-lag controllers, actuator loading; foundational hands-on exposure to ROS 2 and MuJoCo.

Programming and embedded systems: Python, C/C++, VHDL, STM32, Arduino, Linux, Git; UART, SPI, I²C, PWM, ADC, GPIO, and interrupt-driven design.

Engineering tools: Creo, STM32CubeIDE, Tkinter, Flask, PyQt6, Excel-based analysis and reporting; hands-on Thermal Desktop; introductory AutoCAD and SolidWorks.

Measurement and verification: Oscilloscopes, thermocouples/Pico TC-08, thermal and photometric testing, radar S-parameter calibration, requirements development, and test planning.

LANGUAGES:

English: fluent | Spanish: intermediate (speaking, reading, writing) | Italian: intermediate speaking; beginner reading and writing | Samoan: beginner | Russian: beginner

PROFESSIONAL AFFILIATIONS:

Member: Institute of Electrical and Electronics Engineers (IEEE); Society of Women Engineers (SWE); American Society of Mechanical Engineers (ASME).