Alexa Jimena González Lucio

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EDUCATION

Tecnológico de Monterrey (Campus Querétaro) — **Querétaro, México**
- ***Major:*** Robotics and Digital Systems Engineering. — *Graduation date:* June 2026
- ***Cumulative GPA:*** 97/100
- ***Relevant Courses:*** Fundamentals of Deep Learning, Object-Oriented Programming, Implementation of Intelligent Robotics, Analysis and Design of Algorithms, System-on-Chip Design, Advanced Embedded Systems.

PROFESSIONAL EXPERIENCE

Harman International - Embedded Software/ Application Development Intern — **Feb 2025 – Present 2025**
- Developed a PDF comparator for detecting changes between hardware schematics using PyQt5 and PyMuPDF in python.
- Designed a modular application architecture implementing dual visualization, interactive annotations, and hierarchical change management.
- Optimized detection quality and speed by integrating computer vision algorithms with OpenCV, increasing accuracy detection by 65%.

Intel - Project | *Implementation of the AES Algorithm on an FPGA Device* — **Feb 2024 – May 2024**
- Developed a system focused on securing data communication by implementing the AES algorithm on an FPGA using VHDL.
- Led the top-level design team for the component architecture of the algorithm implementation.
- Developed and executed test benches for components of the architecture to validate functionality and performance.

ACADEMIC PROJECTS

Autonomous Driving Robot | OpenCV / YOLO8 — **April 2025 – June 2025**
- Developed a mobile robot with real-time autonomous navigation and intelligent decision-making for safe operation in scaled environments; won *1st place at the 2025 Engineering Expo*, Computer Science Department.
- Trained a custom YOLOv8-small model for real-time recognition of traffic signs and lights. Implemented line following using OpenCV with binarization and morphological processing.
- Designed and implemented a ROS 2-based architecture using nodes for path planning and visual signal processing.

Smart irrigation system | IoT / ESP32 — **Sep – Nov 2024**
- Developed an automated irrigation robot for sustainable agriculture, utilizing soil moisture sensors and
- ESP32-CAM for selective irrigation based on individual plant needs, significantly reducing water waste.
- Integrated OpenCV for basic image recognition and implemented an MQTT network for seamless communication between system modules, enabling intelligent monitoring, and data exchange across the irrigation system.

Access Control System with Raspberry Pi 4 | Embedded Software / Python — **April – June 2024**
- Developed a user access control system using an RFID card reader and a visual interface with real-time monitoring and user registration via a web interface.
- Utilized Tkinter for the local user interface and FastAPI for the web server, alongside socket communication to manage data exchange between the Raspberry Pi and the server efficiently.

TECHNICAL SKILLS

Programming Languages and Technologies

Proficient: C++/C, Python, OpenCV, MySQL, Linux, ROS 2. **Familiar:** Java, JavaScript, HTML, CSS.

LANGUAGES

Spanish: Native speaker
English: Advanced (B2)

LEADERSHIP ACTIVITIES

Experience in Continuous Business Improvement — **Remote**
Proposal development for companies as part of the Innovation and Entrepreneurship course — Jan - Feb 2024
- **Nanakutzi, Mezcal Michoacano**: Planned an approach for attracting tourists and customers.
- **Mr Taco**: Development of strategy for the implementation of a chatbot and business website.

Artistic Promotion Social Project — **Hidalgo, México**
Project founder and violín workshop instructor — Jan 2022 - July 2023
- Planned and organized social impact strategies and music workshops for about 30 people.
- Managed social media and school advertising campaigns to promote community engagement.

Full 'Líderes del Mañana' Scholarship in Instituto Tecnológico de Monterrey (ITESM) — **2022**
- Selected from over 23,000 applicants, with an acceptance rate of 0.8%.

ACHIEVEMENTS

Competitor in the ICPC - *Gran Premio de México 2024* — **October 2024**
- Improved efficiency in coding and debugging in a high-pressure, competitive environment.
- Gained proficiency in data structures, algorithms, and problem-solving techniques while collaborating as a part of the Binary Brains team. (*Scoreboard)*

Municipal Youth Leadership Award — **August 2022**
- Award in the Education category in Tulancingo, Hidalgo, for activities promoting participation in science competitions in Mexico, such as training sessions and talks for students.