Leo Issa Ghoulian

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EDUCATION

California State University, Northridge | Northridge, CA — Expected Graduation: May 2025
Bachelor of Science in Computer Engineering — GPA: 3.9/4.0

PROFESSIONAL EXPERIENCE

Intern | LA Metro — May 2022 – August 2022

- Built a Python/Java app to collect and analyze public safety data by gathering and analyzing data from new technologies implemented across various regions.
- Led a team to successfully integrate the program into existing infrastructure, leveraging NoSQL databases to manage large datasets efficiently and improve system scalability, improving performance by 20%.

PROJECT EXPERIENCE

License Plate Detector/Reader | Machine Learning, Deep Learning | Python — September 2024 - Present

- Developed an image enhancement system integrating fuzzy logic and Machine Learning to improve the clarity of low-quality, blurred license plate images. Implemented pixel-by-pixel processing for high-precision sharpening, improving detection accuracy. Integrated YOLOv5 for real-time object detection, optimizing speed and efficiency. Utilized Python, OpenCV, scikit-fuzzy, and YOLOv5 to enhance performance in challenging visual conditions.
- Collected and processed over 1000 license plate images as part of the training procedure for the Machine Learning program to enhance performance, consistency, and readability of the images by 50%.

Ultrasonic Transponder | Communication System | C++ **|** Arduino IDE — September 2024 - Present

- Developed a bidirectional transceiver system using C++ (Arduino IDE), enabling transmitter and receiver to alternate roles for two-way ultrasonic communication.
- Designed custom PCBs in EasyEDA, ordered them through JLCPCB, and sourced components from Digi-Key, Mouser, and JLCPCB's library. Hand-soldered components for full board assembly and testing.
- Implemented a low-pass RC filter (10 kΩ resistor, 15 nF capacitor) to eliminate high-frequency noise and ensure signal integrity.
- Simulated analog circuits using LTspice to verify signal performance in noisy environments, ensuring system reliability for use cases like robotic navigation.

Traffic Light Controller Design | 74LS139A decoder | D Flip-Flops — September 2022 - November 2022

- Designed and tested a traffic light using a 74LS139A decoder/multiplexer, along with a D flip-flop, and relevant logic gates. Experience with simulating analog and digital circuits using Spice Electronic Design Automation (EDA) tools

Digital Clock Design | VHDL, ModelSim, FPGA, State Machines — September 2023 - November 2023

- Designed a digital clock with hours, minutes, and seconds using VHDL for a 7-segment FPGA display.
- Built a synchronous counter and state machine for time tracking and integrated alarm functionality.
- Created a user interface with push-button input for time and alarm settings
- Simulated the design using ModelSim and successfully demonstrated full functionality on an FPGA board.

LEADERSHIP

California State University Northridge | Project Budget Expansion — September 2022 - August 2022

Increased the Senior Design Project team budget by $1,200 through designing and selling merchandise, enabling the Avionics team to secure essential components for project success.

California State University Northridge | Math Tutor — September 2022 – May 2023