Juan Reyes

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EDUCATION

McMaster University — Sept. 2021 – Apr. 2026
Bachelor of Mechatronics Engineering — *Hamilton, ON*
- Awards: The McMaster University Award of Excellence, Provost's Honour Roll Medal (x3)
- Relevant coursework: Socket Programming (TCP/IP), ML/RL, RTOS (Linux), Forward Kinematics, System Design.

EXPERIENCE

McSCert — Sept. 2025 – Present
Robotic Software Student Researcher — *Hamilton, ON*
- Developed safety-critical software for a Unitree Go2 robot for operation in a hospital setting.
- Built ROS 2 nodes in Python (rclpy) using publishers, subscribers, services, parameters, and QoS tuning to support real-time motion control and behavior switching.
- Implemented a real-time obstacle avoidance pipeline integrating LiDAR and camera data (OpenCV) via sensor fusion, achieving robust navigation under dynamic conditions.

Accipiter Radar — Apr. 2024 – Aug. 2025
Quality Systems Engineering Intern — *Pelham, ON*
- Designed and deployed a production REST API using Go (Gin) with OAuth authentication, supporting 15+ endpoints and serving 100+ users across 10+ clients via a customer-facing web portal.
- Refactored PostgreSQL database schemas to 3NF, introducing foreign key constraints and query optimizations that reduced data duplication, eliminated query bugs, and improved reporting workflows by roughly 70%.
- Built a web-based (Angular) BOM generation and packaging tool served by Flask and integrated it into the engineer-to-order workflow, improving the process by approximately 90%.
- Acted as Quality Coordinator assisting in 25+ documents and 10+ internal audits enabling ISO 9001 certification

McMaster Exoskeleton — Oct. 2024 – Present
Embedded Software Lead — Former Control Systems Lead — *Hamilton, ON*
- Led 6-engineer effort in development of embedded and controls software for a lower-limb robotic exoskeleton, owning system architecture across perception, control, and embedded firmware layers.
- Derived and validated forward kinematics and system models using MATLAB and Simulink flows.
- Developed embedded firmware in C++ enabling CAN bus communication between a Raspberry Pi 5, STM32 microcontrollers, IMUs, and actuators using scheduling and interrupts to reduce latency and improve stability.
- Contributed to a 5th-place finish at the 2025 Applied Collegiate Exoskeleton Competition (University of Michigan).

PROJECTS

Chessmate: Hackathon Winner | React, FastAPI, OpenCV, Arduino, Groq — Sept. 2025
- Built a robotic chessboard system integrating a two-axis gantry driven by NEMA 17 stepper motors, and an Arduino.
- Implemented computer vision using OpenCV on a Raspberry Pi to detect board state and piece movement.
- Built an Agentic React frontend served via FastAPI to manage game state, visualize moves, and provide coaching.
- Selected as one of 12 finalists out of 250+ projects at the University of Waterloo's Hack the North.

Credit Classifier | Python, PyTorch, scikit-learn — Nov. 2025
- Developed a supervised machine learning pipeline to classify credit risk using structured user data.
- Trained and evaluated models using PyTorch and scikit-learn, including CNNs and classical classifiers, optimizing hyperparameters to improve classification accuracy up to 82%.
- Performed data preprocessing, feature engineering, and cross-validation to assess model robustness and generalization.

TECHNICAL SKILLS

Languages: Python, SQL (Postgres), Java, Golang, C#, C/C++, JavaScript, TypeScript, HTML/CSS, R
Frameworks: React, Node.js, Next.js, Angular, Angular-Material, Bootstrap 5, TailwindCSS
Developer Tools: Git, Docker, VS Code, Visual Studio, Vim, Linux, GCC, Jira, Bitbucket, Confluence, Raspberry Pi
Libraries: pandas, NumPy, PyTorch, OpenCV, Scikit-learn, Matplotlib, FastAPI, Flask, Gin, Eigen
Robotics: ROS 2, MATLAB/Simulink, SOLIDWORKS, Inventor, Altium, Multisim, KiCAD, Grafana