Dominic Castaneda

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EDUCATION

Oakland University | Rochester, MI — Expected: December 2027
Bachelor of Science in Engineering, *Mechatronics and Robotics Engineering*, *Minor in Computer Science* — GPA: 3.12
Activities: Macedonian American Student Association (MASA), Member

M-TEC | Controls Technician Certification — April – August 2024
- **Training:** Allen-Bradley PLCs, HMI, PowerFlex VFDs, FANUC robots, motor controls, sensors, RFID, EV safety, OSHA 10.

EXPERIENCE

Schaeffler Group | Troy, MI — September 2025 – December 2025
Chassis R&D Intern – Controls & Mechatronics
- Designed and built a component-level test bench for a ride-height actuator locking mechanism, integrating a dSPACE MicroAutoBox III, CANopen motor control, and torque/position sensing.
- Adapted MATLAB/Simulink control software for bidirectional motion and load-holding sequences targeting 10,000 durability cycles, including PID tuning and motor/sensor data logging.
- Authored a 30-configuration bushing material and lubrication test plan defining baseline characterization, durability procedures, wear assessment, and acceptance criteria.

BorgWarner | Auburn Hills, MI — June 2025 – September 2025
Test Engineer Co-op
- Rebuilt an inherited Electric VCT eMotor DAQ system around NI CompactDAQ, reorganizing wiring, signal conditioning, and power distribution into a compact, portable setup.
- Reworked LabVIEW software with separate PWM-control and signal-acquisition loops to monitor duty cycle, voltage/current, speed feedback, and motor diagnostics.
- Designed and built a 12-channel ESP32-based RPM display with an LCD, BNC inputs, custom wiring, and an enclosure for motor-speed checks before durability testing.

PROJECTS

Machine Vision Sorting Line — *Arduino* | *Fusion*
- Designed in Fusion and built a conveyor with an automatic feeder and camera color detection that routes each coin into a pass, recheck, or reject bin.
- Programmed the Arduino to run the belt and chute, with beam sensors confirming each coin reaches its bin.

Robotic Arm Pick-and-Place System — *Inverse Kinematics* | *Servo Control* | *3D Printing*
- Engineered a team-built robotic arm, sizing its links and servos and drafting the blueprint used for the CAD model.
- Assembled the arm and wrote its control code, with a joystick manual mode and an inverse-kinematics automatic mode that moves blocks from a three-level shelf to sensor-checked drop zones.

Autonomous Target-Tracking Gimbal — *ESP32* | *OpenCV* | *MATLAB/Simulink*
- Developed an OpenCV tracker that finds a selected object in the camera feed and drives a two-axis ESP32 servo gimbal to keep it centered in the frame.
- Integrated an IMU to steady the camera against base motion, tuning the stabilization and tracking loops in Simulink.

Route-Learning Ground Vehicle — *Arduino* | *Python* | *Lidar*
- Implemented a teach mode where the user pushes the vehicle along a route and marks a destination, recording the path for the vehicle to repeat on its own.
- Added lidar obstacle detection so the vehicle stops or steers around objects, then returns to the learned route.

PLC Claw Machine Automation — *Allen-Bradley PLC* | *RSLogix 5000*
- Automated a candy-pickup sequence and manual jog mode in ladder logic, using limit switches to home and position the X/Y axes and timers to lower, lift, and return the claw.
- Mapped six relay outputs and added a part-presence check with a timed warning and one-shot cycle-complete signal.

TECHNICAL SKILLS

Controls & Automation: Allen-Bradley & Siemens PLCs, Studio 5000, RSLogix 5000, Ladder Logic, FactoryTalk HMI, VFDs
Test & Measurement: dSPACE MicroAutoBox III, NI CompactDAQ, LabVIEW, MATLAB/Simulink, CAN/CANopen, PID Tuning
Programming & Tools: Python, C++, MATLAB, OpenCV, JavaScript, HTML/CSS, Fusion 360 (CAD), Git/GitHub, VS Code, Linux
Robotics & Hardware: FANUC Robots, Stepper/Servo Control, IMUs, Sensors, ESP32, Arduino, Soldering, 3D Printing