ALAN RODRÍGUEZ

MECHATRONICS ENGINEER – PRODUCT DESIGN & R&D

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CAREER OBJECTIVE

Secure a hardware engineering role in the automotive industry, leveraging 3+ years in electromechanical design, CAD/CAE simulations, prototype development, validation testing, root cause analysis, product renderings for presentations, and supplier coordination to innovate suspension systems, springs, and automotive parts while ensuring compliance with ISO standards and high-reliability manufacturing. Committed to ensuring automotive-grade standards through hardware robustness, network communication protocols and supplier coordination, while advancing as a multidisciplinary engineer in high-reliability environments.

PROFESSIONAL SUMMARY

Mechatronics Engineer with 5+ years of hands-on experience in mechanical/electromechanical design, CAD/CAE simulations (ANSYS, CATIA), prototype development/validation, root cause analysis, and cross-functional collaborations for defense, industrial, and research sectors. Pursuing MS in Thermofluids at ESIME–IPN, focusing on thermal/fluid dynamics and failure analysis—directly applicable to automotive suspension and power system durability. Proven in high-stakes projects emphasizing reliability, sensor integration, DFM, and methodologies like DFMEA, 8D, and Fishbone. Skilled in product renderings using Adobe Illustrator/CorelDRAW for presentations and bid support. Experienced in government (SEDENA) and academic-industrial partnerships (ITQ), with strong supplier management, technical documentation, APQP/PPAP, and two IMPI registrations. Eager to drive new developments in automotive parts manufacturing.

EDUCATION

Master of Science in Thermofluids (Expected 2026)

National Polytechnic Institute (ESIME – IPN)

Bachelor of Science in Mechatronics Engineering (2019–2024)

Tecnológico de Estudios Superiores de Coacalco

PROFESSIONAL EXPERIENCE

Development Engineer / Mechanical Design Engineer (2019–Present) INTGEN Technologies de México S.A. de C.V., Mexico City, Mexico

Designed and simulated electromechanical systems using SolidWorks, Fusion 360, CATIA, and ANSYS for structural integrity, thermal performance, and failure modes; applied DFMEA/PFMEA for optimizations—transferable to automotive suspension components.

Led prototype development from concept to validation: machined (lathe/milling), assembled, and tested integrating sensors, actuators, and controls under extreme conditions; ensured DFM and robustness via bench testing with oscilloscopes/multimeters.

Prepared product renderings and illustrations using Adobe Illustrator/CorelDRAW for presentations; supported bid processes (licitaciones) through technical documentation, supplier alignment, and cost/quality evaluations.

Coordinated with suppliers and stakeholders (e.g., SEDENA, ITQ) on project deliverables, specifications tracking, and change control; advised biorefinery on sustainable processes, mirroring automotive supplier coordination and APQP.

Delivered conferences on ballistic testing and taught MicroPython courses, enhancing cross-team communication and knowledge transfer in multidisciplinary environments.

KEY PROJECTS

SARAF (Remote Firearm Actuation System)

Designed CAD elements and LabView programming for sensor integration, actuation, and remote control; ensured module compatibility analogous to automotive network protocols (CAN/LIN).

SAVLE (Virtual Laser-Electronic Training System)

Developed system functionality with failure resolution and root cause analysis, applicable to automotive hardware reliability.

Adhesion Testing Machine for Ballistic Laminated Glass (IMPI-Registered)

Led design, manufacturing, assembly, validation, and methodology definition using CATIA/ANSYS; focused on packaging, experimental testing, and failure analysis—relevant to automotive part development.

Waste Separation System Using Computer Vision (Collaboration with ITQ)

Integrated AI (OpenCV/Python), sensors, and actuators; optimized for automated classification, testing, and system integration.

Biorefinery Fuel Development

Provided technical advising on biomass processes, supplier coordination, and deliverables for sustainable systems.

TECHNICAL SKILLS

CAD/CAE & Simulation

Expert: SolidWorks, Fusion 360, CATIA (3D design/packaging), ANSYS (structural/thermofluid)

Proficient: AFDEX, Proteus; In Progress: SPICE/LTSpice

Programming & Automation

Python (data processing, OpenCV AI), C++, LabView, MicroPython (embedded/IoT), Basic PLC

In Progress: CANoe/CANalyzer (vehicle protocols)

Electronics & Manufacturing

Sensors/actuators integration, discrete-time controls, robotics (ROS), oscilloscope/multimeter

Processes: Plastic injection molding, metal forming, machining, DFM/SLA, root cause (5 Whys/Fishbone)

Automotive-Relevant

Standards: ISO 26262 (in progress), AEC-Q100

Methodologies: APQP/PPAP, Six Sigma

Tools: 3DX/Enovia, Wireshark, Jira/Microsoft Project

Design & Communication

Adobe Illustrator, CorelDRAW (product renderings/presentations)

Microsoft Office/Visio for bids and documentation

RESEARCH & ACHIEVEMENTS

MS research in thermofluids for electronic/system failures; presented at seminars on mechanical systems and testing.

Two IMPI registrations for innovative testing systems; multidisciplinary contributions in defense, research, and biorefinery emphasizing innovation and reliability.

LANGUAGES

English: Intermediate (TOEFL Certified; Technical/Professional)

Spanish: Native