Diego Flores Martínez

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Online Portfolio

EDUCATION

Monterrey, NL, México | **08/2021 - Present**

Instituto Tecnológico de Estudios Superiores de Monterrey | Bachelor of Mechatronics Engineering

- Cumulative **GPA:** 3.64/4.00

Minor | Automotive Engineering

WORK EXPERIENCE

John Deere Monterrey, NL, México | **09/2023 - Present**

Hydraulics Design Intern

- Designed precise **3D models of hydraulic** systems for agricultural machinery utilizing **Creo Parametric**; ensured all technical drawings met industry standards to improve accuracy in the manufacturing workflow.
- Developed detailed **flexible components** simulations for specialized agricultural machinery utilizing **Industrial Path Solutions**, ensuring compliance with industry standards and enabling the production team to streamline assembly
- Participated in initiatives involving **collaboration** as part of the **Continuous Improvement** team for recurrent structural flaws identified during testing phase.
- Participated in initiatives involving **collaboration** as part of the **EPDP** team working in future projects applications and implementation.

F.I.R.S.T. Competition Monterrey, NL, México | **08/2018 – 06/2021**

Design and Manufacture Team/ Design team leader

- Designed precise **3D models** of the robot's main systems using **CAD software**, ensuring all designs met competition standards and improved the assembly process.
- Managed a sub-team focused on the development of a specialized **intake mechanism**, overseeing the design, and **manufacturing phases** to meet performance requirements.
- Collaborated with team members to implement iterative design processes and ensure the integration of the mechanism within the overall robot system.
- Participated in the testing and optimization of mechanical subsystems, applying feedback to improve reliability and performance during competition.

PROJECTS

Ternium & Metalsa Collaboration

- Utilized **ANSYS Workbench** to analyze chassis geometry, uncovering design weaknesses and enhancing the structure's modularity to support both internal combustion and electric vehicle platforms.
- Leveraged advanced **static physics principles** within **SOLIDWORKS** to refine chassis geometry, realizing a **15% weight reduction** and improving modularity for greater assembly efficiency and design versatility.
- Reviewed Ternium's iron material options, selecting the most suitable material based on mechanical properties; the chosen material provided a 15% weight reduction without compromising structural strength.

Piaggio Collaboration

- Analyzed performance data from combustion engine and electric motor carts using a **SuperFlow dynamometer**, uncovering key **retrofitting strategies** that achieved a power output variance within an acceptable 5% margin, ensuring project feasibility.
- Directed the design of innovative geometric layouts for the three-wheeled vehicle's powertrain components, increasing integration efficiency by 20% while maintaining modular capabilities for use across various frameworks.
- Performed performance testing on electric motor carts, **evaluating battery power output and efficiency** as part of retrofitting efforts, resulting in a **10% reduction in battery train weight** and corresponding decrease in energy consumption.
- Utilized **statistical analysis in Excel** to calculate key metrics such as **rolling resistance and aerodynamic coefficients**, leveraging data-driven decisions to **optimize vehicle performance**.

Parker Collaboration

- Achieved enhanced process reliability through the design of a fully integrated automatic assembly cell featuring safety measures and real-time monitoring capabilities using **Cognex technology**.
- Developed custom **feeders and fixtures** for automated presses, which reduced manual intervention by 60% and decreased production cycle time, enhancing overall operational efficiency and consistency.

ACHIEVEMENTS

- Participated in national, regional and global robotics competitions as part of a high-performing team, contributing to four separate championship victories through strategic design and manufacturing leadership.
- Accomplished the first **internship at John Deere**, contributing to advanced projects in agricultural machinery that streamlined development processes and enhanced product efficiency for future innovations.
- **Received acknowledgment** from **Parker** for a groundbreaking manufacturing cell design, addressing key operational challenges while contributing findings that targeted the three biggest causes of delays in the assembly process.
- **Received recognition** from **John Deere** for developing an innovative fixture proposal to bend a critical plate, significantly improving manufacturing precision and workflow.
- **Received recognition** from **ABB** for the design of a robotic welding cell, addressing key operational challenges and enhancing production efficiency.

SKILLS

- Project management & teamwork
- Collaboration & communication
- Problem-solving & critical thinking
- Adaptability & continuous learning
- Time management
- Advanced mechanics & structural analysis
- Material science & metallurgy
- Electric and ICE powertrain knowledge & power electronics
- Battery systems & powertrain integration (basic understanding)
- CAD (SolidWorks, Creo Parametric, CATIA)
- Geometric Dimensioning & Tolerancing (GD&T)
- Automation, PLCs, and robotic systems
- LT spice, NI Multisim
- Design for Manufacturability (DFM) & Design for Assembly (DFA)
- FEM (Ansys, IPS)
- Matlab & Simulink
- Automation Studio, FluidSIM
- CarSim
- Tecnomatix Plant Simulation
- Tecnomatix Process Simulate
- Fixture and tooling
- Python, C++ and LabVIEW