

# Ana Lizette González Cataño

Chihuahua, Chihuahua, México

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## Summary

Mechanical Engineer with strong skills in CAD modelling, product development, user-focused prototyping, and manufacturing-oriented design. Experienced in creating 3D-printed tools, ergonomic fixtures, and design concepts that improve usability, reduce assembly time, and enhance product reliability. Skilled in SolidWorks, NX, and FEA methods, with a background spanning concept generation, DFMA, and hands-on testing. Combines engineering rigour with creative design abilities, supported by practical experience in documentation, graphic design, and multidisciplinary project work.

## Education

### Cranfield University

Cranfield, United Kingdom

M.Sc. ADVANCED MOTORSPORT ENGINEERING

Sept. 2023 - Sept. 2024

- Modules: Powertrains, Motorsports Electronics and Data Acquisition, Business of Motorsport, Vehicle Dynamics, Aerodynamics, Computational Fluid Dynamics, Composite Structures, Structural Analysis
- Extracurricular Activities: F1 Design Sprint

### Tecnológico de Monterrey

Chihuahua, Chihuahua, México &

Monterrey, Nuevo León, México

B.Sc. MECHANICAL ENGINEERING

Aug. 2019 - June 2023

- Final grade of 92.32 with Academic Distinction
- 40% merit scholarship granted due to academic performance & entrance evaluation
- Extracurriculars: Gravity Racecar Team (build & driver), Teaching & Leadership programme, violin workshop
- Mathematics & Data Science, Image Culture, Public Speaking, Ethics & Sustainability, Automotive Engineering, Image Culture

## Work Experience

### Emerson

Chihuahua, Chihuahua, México

DESIGN INTERNSHIP

March 2023 - June 2023

- Designed and 3-D printed a prototype seal for orbital weld heads, improving fit and airtightness to minimise contamination and leakage.
- Updated legacy blueprints and corrected dimensional inaccuracies applying ASME Y14.5 standards to eliminate production issues.
- Created a compact tray for multi-size bobbin handles, optimising space usage, rotation, and static isolation while reducing assembly time.
- Developed a rapid tracing fixture for weld-repellent pens, ensuring consistent height, straightness, and uniform application around pipe circumferences.
- Designed ergonomic handling tools for thin copper wires, preventing damage and improving placement precision in small coils.
- Produced single-piece 3D-printed clamps for brazing Coriolis mass flow sensors, reducing thermal damage risk and simplifying furnace setup.
- Developed a coil transport tray with bone-shaped slots to maximise capacity and protect electromagnetically sensitive parts. Presented full design analyses to senior supervisors, applying DFA/DFMA principles and proposing cost and time-saving improvements.

## Relevant Projects

### Carbon Fibre Wing Airfoil with Flax C Spar/Core

Cranfield University, United

Kingdom

COMPOSITE STRUCTURES PROJECT

January 2024

- Manufactured a carbon fibre airfoil with a flax C-Spar and core, documenting processes for repeatability and error reduction.
- Calculated predicted deflection under load and validated via 3-point bending tests analysing discrepancies between theory and experiment.

### Mechanically-Assisted Screw Dispenser Design

Tecnológico de Monterrey,

Chihuahua, México

ELECTRONICS MANUFACTURING FIXTURE (SMT)

May 2023

- Designed a fixture to reduce assembly line by 40% for high tension industrial connectors.
- Conducted risk analysis, DFMA review, and FEA simulations to validate motion smoothness, structural integrity, and reliability.
- Selected cost-efficient materials compatible with electromagnetic requirements.
- Created full CAD and technical drawings using ASME Y14.5-2018 standards.

### Group Design Project: Alternative-Fuel Racing Vehicle

Cranfield University, United

Kingdom

MULTI-DISCIPLINARY 3-MONTH PROJECT

February 2024

- Contributed to concept design of a rotary-engine racing vehicle for drag, circuit, and rally style events whilst being street legal.
- Built track models using Solidworks, Blender, OpenStreetMap, DEM, and LIDAR data to support accurate simulation conditions.
- Developed MATLAB tools for early suspension configuration, including damper and spring selection based on mass and ride frequency.
- Designed suspension packaging, including in-wheel motors, custom knuckles, gearboxes, and horizontal damper layouts.
- Produced regulatory-compliant lighting and bodywork elements and contributed to final presentations and renders.

## Autonomous Guide Vehicle (AGV)

Tecnológico de Monterrey, Nuevo

León, México

November 2022

### DESIGN AND MANUFACTURING

- Led chassis design and building using ASTM A36 steel for a hospital logistics AGV.
- Conducted structural FEA, defined suspension anchor points, produced technical drawings, and participated in welding and assembly.

## Engine Piston Rod Failure Analysis

Tecnológico de Monterrey,

Chihuahua, México

February 2022

### BACHELOR'S DEGREE PROJECT

- Performed metallographic analysis on a TEO-540-C1A engine rod.
- Conducted fatigue modelling, polishing, mounting, and microscopic inspection to determine material behaviour and failure mechanisms.

## Skills

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### Engineering Tools

- ANSYS, Matlab, Python, FEA, basic CFD, material selection, composites

### Prototyping

- 3D printing, rapid prototyping, ergonomic fixtures, assembly aids.

### Design Tools

- Solidworks, NX, CAD surfacing, 3D modelling, technical drawing (ASME Y14.5)

### Other

- Power tools, hand tools, welding, graphic design (icons, layouts, documentation), report design & formatting

## Other Experience & Projects

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### Maker Fest Vehicle Mechanics Showcase & Presentation

Chihuahua, Chihuahua, México

#### SUCESSO MOTOR STUDENT GROUP

November 21 2025

- by showcasing a few vehicle components and giving a short presentation on engine fundamentals and suspension systems, along with a small hands-on activity.

### Technical Safety Powertrains Inspector, Volunteering

Chihuahua, Chihuahua, México

#### SUPER COPA ROSHFRANS

September 4 2025 - September 8 2025

- Flag marshal for GTM & Tractocamiones practice sessions, monitored track safety and reported incidents.
- Conducted technical scrutineering, verified seals, checked driver PPE, supervised pit lane logistics, and assisted with fuel sample handling.

### Graphic Design Contractor

Chihuahua, Chihuahua, México

#### FEI HÍPICA'S EVENT

August 11 2025 - September 8 2025

(Contract)

- Designed guidebooks, banners, signage icons, and formatted documents following FEI branding and event specifications.

### Event Support Staff

Chihuahua, Chihuahua, México

#### "CLÁSICO" CLUB HÍPICO CAMPESTRE DE CHIHUAHUA

May 21 2025 - June 5 2025 (Contract)

- Supported logistics, awards delivery, vendor coordination, and administrative tasks during the annual show jumping competition.

### Hackathon

Chihuahua, Chihuahua, México

#### INNOVATIVE TECHNOLOGY & CODING COMPETITION

2018

- Developed a GPS-tracking pet collar concept, placed second overall.