Matthew Dubea

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Education

University of Louisiana at Lafayette – B.S. Mechanical Engineering, Minor: Mathematics	May 2025
UCL, London, UK – Study Abroad in Energy Systems and Engineering Design	Summer 2024

Continuous Learning

FE Exam – Mechanical (NCEES)	Expected: Aug 2025
OSHA Process Safety Management (PSM)	Expected: Jul 2025

Projects

Design and Fabrication of Race Tricycle mtdubea.github.io/trike — 2025

- Designed race trike in SolidWorks; validated 4130/1018 steel frame via FEA (FoS = 2.2) under race loading
- Applied DFM/DFA and Lean to streamline TIG and CNC processes, cutting assembly time 25% and rework
- Tuned CG (22" rear, 23" high) and geometry (4" cranks, 8.25" span, 19.5" track, 23.75" wheelbase); tip angle = 23°
- Ran PFMEA on frame/axle; revised gussets, bushings, and weld prep to eliminate failure modes and boost fatigue life
- Fabricated stem, bushings, and T-insert to ±0.005" tolerance for repeatable seat fit and structural alignment
- Reused and modified MTB frame, bars, and stem to reduce cost and material waste by 30%
- Placed 1st overall (3:31 fastest lap); completed 4/5 heats penalty-free; peak speed = 14.5 mph; total cost: $211.94

Multi-Sensor Payload System
mtdubea.github.io/mechatronics — 2024

- Coded Arduino system in C++/Python to release payload based on temp ($\geq 32°C$), distance, and water input
- Calibrated MPU-9250 IMU and NTC thermistor; tuned sensor thresholds to prevent false triggers during testing
- Used Servo.h to control SG90 via PWM; implemented if-else logic and basic PID for LED, buzzer, and servo
- Debugged system via Serial Monitor; verified tilt readings, LCD output, and servo response in test flights
- Designed dual supply: 6xAA (5V) for logic, isolated 9V for servos with external backup
- Mounted on UAV; ultrasonic sensor triggered buzzer and servo at ≤ 10in. proximity
- Integrated all sensors to automate multi-trigger payload drop using sequential logic

Autonomous Rescue Robot
mtdubea.github.io/robot — 2023

- Led mechanical design and Python integration of autonomous robot; completed 5-task course with full system autonomy
- Earned 1st in judged design for engineering execution; placed 10th live due to early sensor trigger and collision
- Fabricated boom with telescoping actuator and solenoid hook to retrieve targets from 12" spinner platform
- Tuned stepper PID logic to reduce overshoot $\leq 70\%$ and comply with 18"x12"x24" dimensional constraints
- Developed 6-script modular control stack; resolved IR/magnetic sensor interference via shielding and delay logic

Field Experience

Safelite AutoGlass, Scott, LA — *Auto Glass Technician* — 2022 – 2024

- Replaced 2,600+ windshields (98% QA/QC); calibrated 1,500+ ADAS/LiDAR systems to OEM spec using scan tools
- Cut install cycle time by 15% by redesigning adhesive curing workflow and reorganizing tool layout for field efficiency
- Ensured compliance with OEM procedures during calibration and glass replacement to reduce warranty claims and rework

Ernest P. Breaux Electrical, New Iberia, LA — *Electrician / Machine Operator* — 2019 – 2021

- Installed and terminated MV/LV panels, conduit, and cable tray on a 34.5kV yard to support substation energization
- Fabricated and fitted electrical/mechanical components with minor QC adjustments to meet install deadlines
- Logged equipment uptime in Excel and supported MOC/PSSR completion to enable startup/shutdown commissioning

Certifications

Six Sigma Black Belt – The Council for Six Sigma Certification (CSSC)	2025
Certified SolidWorks Associate (CSWA) – Dassault Systèmes	2023
OSHA 10-Hour General Industry – U.S. Department of Labor	2019

Skills

SolidWorks (CSWA), AutoCAD, CAE, Ansys Granta, FEA, CFD, Process Flow Diagrams (PFD), DFM/DFA, PFMEA, Root Cause Analysis, GD&T, Python, C++, MATLAB, Excel, SAP, PID, CNC Simulation (Tooling U-SME)

Involvement

College of Engineering – S.A. Ambassador (ULL)	2024 – 2025
Louisiana Engineering Society (LES)	2024 – 2025
Society of Manufacturing Engineers (SME)	2024 - 2025
American Society of Mechanical Engineers (ASME)	2023 – 2025
American Society for Testing and Materials (ASTM)	2025