

Diego Rodriguez.

• OPEN TO ROLES • MAY 2026

Mechanical Engineer · Product Development · Medical Devices & Robotics

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UW–Madison Mechanical Engineering graduate (May 2026) who ships physical products — six teaching otoscopes in use at UW Vet Med, a competition rover that placed 12th of 34 at URC, and a habit of letting real-world testing shape the design.

01 SELECTED PROJECTS

Veterinary Video Otoscope Housing 2025 - 2026

UW–Madison School of Veterinary Medicine · *Mechanical Designer* · Student team

6 units at UW Vet Med **\$180** /unit vs. \$500 **3** design iterations

- Redesigned a 0.31 lb plastic prototype into a 1.1 lb **knurled steel teaching instrument** matching the handfeel of the Welch Allyn clinical otoscope students will encounter in practice.
- Owned the **rotating 3D-printed cable insert** in the end cap — lets the end cap thread on without twisting the charging cable, a problem cadaver testing surfaced.
- Machined the steel handles on the lathe; specified **head-to-handle thread interface** and button tolerances on the wireless camera module.

Swerve-Drive Module 2024 - 2025

Wisconsin Robotics · *Drivetrain Subteam* · ~50 lb URC competition rover

12th / 34 teams at University Rover Challenge **SF 2.08** vs. 1.80 target

- Owned the **structural support tube-to-gearbox interface** for the swerve modules — eliminated module flex, raised the motor above terrain, enabled reliable in-place turning.
- Ran a **three-material stress study** (6061 Al / 4130 steel / Titanium) in EES; selected 6061 Aluminum on the weight–cost–strength trade and presented the rationale to the subteam.

Two-Stage Gear Reducer + ML Optimization 2025

Course project · *Analytical design* · *Solo Python extension*

12% lighter design **2,500** -design ML sweep

- Hand-designed a **4.5:1 two-stage spur gear reducer** to AGMA / Buckingham spec in EES; sized 1045 HR shafts and 4140 gears with $SF_{\text{shaft}} 1.58$, $SF_{\text{gear}} 1.31$.
- Built a **Python + Random Forest surrogate** to sweep 2,500 candidates and surface a 12% lighter feasible variant — holding $SF_{\text{shaft}} \geq 1.5$ and $SF_{\text{gear}} \geq 1.2$.

CO₂ Sensing Alert System 2022 - 2023

Hibernating-squirrel research client · *Mechanical lead*

9.84 s avg. latency (n=10) **\$149.20** /unit vs. \$300 budget

- Designed a noninvasive CO₂ monitoring enclosure that **detects the spike marking interbout euthermia** — the narrow window when researchers can study hibernating ground squirrels. Validated at 5,000 ppm in cold storage.

02 EDUCATION

University of Wisconsin–Madison

B.S. Mechanical Engineering
College of Engineering
May 2026 · GPA 3.3 / 4.0

03 TOOLBELT

CAD

SolidWorks, Onshape, AutoCAD, GD&T

ANALYSIS

EES, FEA, Tolerance Stack-Up, FMEA

CODE

Python (NumPy, scikit-learn), MATLAB

MAKE

Manual + CNC lathe, mill, FDM/SLA 3D printing, soldering

APPROACH

DFM/DFA, human-centered design, rapid prototyping, user & cadaver testing

04 QUICK STATS

URC finish	12 / 34
Otoscopes shipped	6
Iterations on otoscope	3
Gear reducer lightened	12%
CO ₂ alert latency	9.84 s

05 TARGETING

Medical devices · Product development · Design engineering · Robotics. Twin Cities preferred, open elsewhere.