

# Alonso Garcia

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## EDUCATION

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### Northern Arizona University (NAU)

Mechanical Engineering, Bachelor of Science

Computer Science, Bachelor of Science

Mechanical Engineering, Master of Engineering

GPA: 3.97/4.00

Flagstaff, AZ

May 2026

May 2026

Dec 2027

## PROJECTS

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### Permanent Magnetic Synchronous Generator (PMSG)

Flagstaff, AZ

CAD Engineer and Manufacturing Engineer

Jan 2025 – Present

- Developed a minimum viable product of a dynamometer test bench with voltage, current, rotational speed, and torque measurement capabilities within 50% of the scheduled timeframe
- Designed the PMSG shaft and bearings via MATLAB and SolidWorks to meet 100% of Collegiate Wind Competition-certified test conditions
- Performed ball bearing life analysis for PMSG wind turbine applications in MATLAB, validating an estimated 4-year operational lifespan.

### Dynamometer-Integrated Data Acquisition (DAQ) System

Flagstaff, AZ

Test Engineer

Jan 2025 – Present

- Implemented the minimum viable product with voltage, current, rotational speed, and torque DAQ capabilities within 50% of the schedule timeframe
- Optimized the voltage divider and current sensor readings by programming a custom algorithm with an Arduino, reducing error by 70%
- Rebuilt the dynamometer with a custom extender, designed in SolidWorks, increasing measurable torque capacity by 117%
- Programmed a tachometer using an infrared sensor and interrupt-based programming, allowing measurements up to 5700 RPM with  $\pm 2\%$  error
- Constructed a high-voltage and high-current distribution circuit using 12 AWG wires to handle 48V and 24A input from a PMSG

### Search and Rescue (SAR) Drone

Flagstaff, AZ

Design Engineer

Fall 2024

- Conducted a state-of-the-art (SOTA) literature review on communication systems, leading to a 70% production cost reduction compared to equivalent suppliers by varying flight time with payload and less throttle use
- Optimized drone frame design in MATLAB, increasing full-throttle speed by 13% compared to competitors
- Designed the communications system with the SOTA literature review, resulting in a 29% transmission distance increase compared to competitors

## EXPERIENCE

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### Uncertainty Quantification, Learning, Interface, and Design Lab Internship

Flagstaff, AZ

Undergraduate Researcher

Aug 2024 – Present

- Developed a topology optimization software for structural designs in Julia, enabling up to 90% weight reduction without compromising performance
- Programmed the topology optimization software workflow using Julia, enabling optimized part generation within 1 hour (work in progress to reduce optimization duration)
- Presented a [poster](#) on topology optimization for structural designs at NAU's 2025 Undergraduate Symposium, receiving a score of 90%

## SKILLS

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- SolidWorks Ansys MATLAB Python Milling Soldering