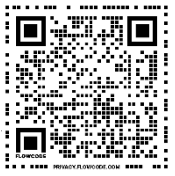


# CALLA REN TAYLOR, E.I.T.

(904) 309-2222 | callartaylor@gmail.com | Jacksonville, FL

Mechanical Engineer



## EDUCATION

BACHELOR'S DEGREE | Bachelor of Science (Mechanical Engineering) | University of North Florida (3.96 GPA)

May 2025

ASSOCIATE'S DEGREE | Associate of Arts | Florida State College at Jacksonville (4.0 GPA)

May 2021

## PROFESSIONAL EXPERIENCE

**R&D ENGINEERING INTERN** | Star Catcher Industries | Jacksonville, FL

May 2025 – Present

Led mechanical design of a high-altitude balloon (HAB) payload, delivering a full payload assembly from concept to flight-ready prototype in a fast paced design environment

- Designed a lightweight receiver with a carbon fiber frame, custom solar panels, and telemetry hardware real-time tracking and diagnostics
- Developed a cutdown system in compliance with FAA regulations to enable controlled descent and payload recovery
- Designed a helium inflation assembly optimized for field use and safe high-altitude balloon deployment
- Engineered the remote tether release system to safely deploy the balloon during operation to protect ground personnel from high energy emissions

**R&D ENGINEERING INTERN** | Medtronic Inc. | Jacksonville, FL

May 2024 – May 2025

Collaborated with mechanical and electrical engineers to design, test, and optimize components for biomedical equipment development

- Used 3D printing (PLA, PETG, ABS, TPU) and machining (drilling, milling, wire EDM) to rapidly prototype and iterate early-stage product designs
- Designed a spring-loaded irrigation cassette button, alongside injection mold designers to optimize geometry, draft angles, and parting lines
- Performed tolerance stack-up analysis (worst-case & RSS) to predict part variations and ensure functionality and manufacturability
- Conducted assembly analysis to evaluate fit and alignment of components in complex subassemblies
- Performed FEA (ANSYS) including impact loading simulations to predict part failures and validate material selection, providing data driven insights that contributed to design improvements
- Designed, programed, and validated test fixtures using Creo and Arduino to support life-cycle and fatigue testing of biomedical equipment during new product development

**UNDERGRADUATE RESEARCH ASSISTANT** | University of North Florida | Jacksonville, FL

Jul 2023 – May 2025

Modeled mechanical parts in SolidWorks and prepared them for finite element analysis in Ansys

- Created models representing crack propagation on notched specimens for finite element analysis

**LEAD MECHANICAL ENGINEERING TUTOR** | University of North Florida | Jacksonville, FL

Feb 2023 – May 2024

Supervised and mentored engineering, physics, and computing tutors to ensure program integrity and consistent student success

- Managed and mentored a team of engineering, physics, and computing tutors, conducting regular observations and providing constructive feedback to improve tutoring techniques
- Led training sessions and workshops, developing lesson plans and presentations to enhance tutors' instructional skills and maintain program consistency
- Delivered one-on-one and group tutoring sessions across multiple STEM courses to facilitate the academic success of over 50 students
- Ensured program integrity by reinforcing tutoring standards and fostering a collaborative learning environment
- Collaborated with faculty to align tutoring strategies with course objectives and student needs

**SEASONAL ARCHITECTURE INTERN** | The Haskell Company Inc. | Jacksonville, FL

May 2021 – Jul 2021

Supported architectural design and documentation by creating and updating Revit models and site plans for large-scale commercial projects

- Developed a detailed Revit model of existing NFL stadium infrastructure from point cloud data using Cintoo to support the company's bid for a major renovation contract
- Updated site plans and coordinated revisions to promote the alignment of goals in a multidisciplinary design environment

## LICENSING, ACHIEVEMENTS, & PUBLICATIONS

|                                                                                                                                                                                               |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Engineer in Training (E.I.T) Certified                                                                                                                                                        | Jan 2024 |
| <ul style="list-style-type: none"><li>Passed the Fundamentals of Engineering (FE) Exam</li></ul>                                                                                              |          |
| Thermal Performance of Hollow Fluid Filled Heat Sinks                                                                                                                                         | Mar 2025 |
| <ul style="list-style-type: none"><li>Published research findings in MDPI's Energies journal. (<a href="https://doi.org/10.3390/en18071564">https://doi.org/10.3390/en18071564</a>)</li></ul> |          |
| ASME's 17th International Energy Sustainability and Heat Transfer Conference Research Presenter                                                                                               | Jul 2023 |
| <ul style="list-style-type: none"><li>Won 1st place in a design hackathon to develop a carbon capture and storage method for off-grid diesel generators in Gwakwani Village, Africa</li></ul> |          |
| ASME's Summer Heat Transfer Conference                                                                                                                                                        | Jul 2024 |
| <ul style="list-style-type: none"><li>Presented research on the thermal performance of liquid cooled heat sinks</li></ul>                                                                     |          |

## RELEVANT EXPERIENCE & PROJECTS

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>SENIOR DESIGN - QUALITY CONTROL TEST FIXTURE</b>   Medtronic Inc.   Jacksonville, FL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Aug 2024 – May 2025 |
| Designed a precision test fixture to automate end-of-line quality assurance on surgical devices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |
| <ul style="list-style-type: none"><li>Led the design and build of the XY movement system for precise positioning of a linear actuator</li><li>Designed a system that performed comprehensive testing of all critical functions to ensure device functionality and reliability</li><li>Enhanced quality control processes to reduce the likelihood of manufacturing defects</li></ul>                                                                                                                                                                                                                   |                     |
| <b>HIGH ALTITUDE STUDENT PLATFORM PROJECT</b>   Sponsored by NASA   Jacksonville, FL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Mar 2023 – May 2024 |
| Redesigned and constructed a high-altitude payload intended to measure ozone concentration in the upper atmosphere                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |
| <ul style="list-style-type: none"><li>Engineered the high-altitude payload to withstand temperature, pressure, and mechanical stresses encountered during flight, ensuring durability and mission success</li><li>Developed an innovative folding enclosure to provide easy access to internal components, improving accessibility to the internal components for maintenance</li></ul>                                                                                                                                                                                                                |                     |
| <b>NATIONWIDE ECLIPSE BALLOONING PROJECT</b>   Sponsored by NASA   Jacksonville, FL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Mar 2023 – Apr 2024 |
| Served as telemetry officer for the Nationwide Eclipse Ballooning Project, supporting data acquisition and high-altitude balloon deployment to study gravity waves and capture footage of the 2024 total solar eclipse                                                                                                                                                                                                                                                                                                                                                                                 |                     |
| <ul style="list-style-type: none"><li>Collaborated with a multidisciplinary group to design and optimize payloads and facilitate launch operations</li><li>Analyzed telemetry data during launches to make critical decisions for venting commands to ensure mission success and optimal flight conditions</li><li>Performed real-time troubleshooting and decision-making during balloon flights to support the success of the project</li></ul>                                                                                                                                                      |                     |
| <b>LIQUID COOLED HEAT SINK RESEARCH</b>   University of North Florida   Jacksonville, FL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | May 2023 – Jul 2024 |
| Conducted undergraduate research on the thermal performance of heat pipes and fluid-filled fin arrays to explore innovative approaches to lightweight, high-efficiency heat sink designs                                                                                                                                                                                                                                                                                                                                                                                                               |                     |
| <ul style="list-style-type: none"><li>Evaluated the viability of integrating heat pipe technology into various fin geometries to reduce thermal resistance and improve cooling efficiency in compact systems</li><li>Investigated internal fluid motion within hollow, fluid-filled fin arrays to understand the role of fluid dynamics in enhancing heat dissipation</li><li>Fabricated and tested hollow, fluid filled fin arrays to analyze the thermal resistance and efficiency</li><li>Compiled research findings to present at ASME's Summer Heat Transfer Conference in July of 2024</li></ul> |                     |
| <b>BIKE FRAME FEA</b>   University of North Florida   Jacksonville, FL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | May 2023 – Jul 2024 |
| Conducted a structural optimization study on a bike frame to improve fatigue resistance and durability using finite element analysis (FEA) tools including ANSYS and nCode2024                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |
| <ul style="list-style-type: none"><li>Simulated multiple load distribution scenarios to identify critical stress concentrations and predict fatigue life under realistic riding conditions</li><li>Applied FEA to evaluate the effects of geometry and material changes, guiding design modifications to reduce peak stresses</li><li>Conducted fatigue life simulations using Ansys and nCode to improve frame durability by over 200%</li><li>Optimized geometry to meet a 90% survival probability over 300,000 hours of simulated operation, reducing the risk of long-term failure</li></ul>      |                     |

## TECHINICAL SKILLS

**3D Modeling and Drafting:** SolidWorks | PTC Creo | Siemens NX | Inventor

**Finite Element Analysis:** ANSYS | SolidWorks | PTC Creo NCode

**Manufacturing:** 3-D Printing | Milling | Drilling | Lathing

**Programming:** MATLAB | C | Arduino

**Other:** Strong verbal/written communication | Project-based collaboration | Research writing | Tolerance Stack-Up Analysis | Leadership