**Marco Jonsson | San Antonio, Texas**

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**EDUCATION**

**Trinity University** San Antonio, TX | May 2025 Bachelor of Science in Computer Science | Bachelor of Science in Physics | Minor in Mathematics

Semmes Endowed Full-Tuition Scholar | Garnett G. Gray Physics Award | Wagner Senior Physics Award

*Honors Thesis: "From Stability to Turbulence: A Mechanical and Computational Study of Taylor-Couette Flow."*

Relevant Coursework:

**Computer Science:** Artificial Intelligence | Software Engineering | Database Systems | Mobile App Development | Network Security | Functional Programming | Computer Design | Algorithms

**Physics:** Mechanics | Electromagnetism | Modern Physics | Quantum Physics 1, 2 | Classical Mechanics | Nonlinear Dynamics | Statistical Mechanics | Waves and Optics | Electromagnetic Fields | Electronics

**Math:** Calculus 1, 2, 3 | Linear Algebra | Differential Equations | Mathematical Methods | Real Analysis

**TECHNICAL SKILLS**

**Programming Languages**: Python, C, Scala, Haskell, MATLAB, JavaScript, HTML/CSS, LaTeX.

**Specialized Software, Frameworks, and Libraries**: AutoDesk Fusion, TensorFlow Lite, Docker, Git, NASA Koviz.

**Web Frameworks**: Flask, Axios, React.

**Databases**: SQL (MySQL) NoSQL (MongoDB).

**Related Skills**: Technical Writing, Mathematical Modeling, Arduino Robotics/Circuitry, CNC Machining.

**Spoken Languages:** English and Spanish native speaker.

**PROFESSIONAL EXPERIENCE**

**Software and Machine-Learning Intern** May 2024 – August 2024

*Vedo Systems Houston, Texas*

* Contributed to ***Whetstone***, an ML-based fault detection software for a **NASA contract**.
* Improved ML model accuracy from **15% to 85%** through algorithm optimization.
* Developed an **18-page technical report** for client-facing model analysis.
* Expanded **orbital simulation** to enhance regression testing capabilities.
* Added new features to **major software release v1.1 and minor update v1.1.1**.

**Technical Skills & Tools:** Python, TFLite, JavaScript, SQL, Docker, Git, LaTeX.

**Researcher – Fluid Dynamics and Engineering** January 2023 – August 2023 | August 2024 – Present

*Trinity University Department of Physics and Astronomy San Antonio, Texas*

* **Designed and built** a **Taylor-Couette vortex generator** for fluid dynamics experimentation.
* **Presented** design and construction processat **TU** **Undergraduate Research Symposium.**
* Developed **custom circuitry** to interface with salvaged motors.
* Created software to apply **FFT (Fast Fourier Transform)** to optical fluid data for flow bifurcation analysis.

**Technical Skills & Tools:** Autodesk Fusion, C, Arduino, Circuit Design, MATLAB, LaTeX.

**PROJECT EXPERIENCE**

**2-D Ray Tracing in C –** [**Github Repository**](https://github.com/mjonsson01/raytracingC) Spring 2025

*Independent Project*

* Developed a **custom 2D ray tracing engine** in C with SDL2 to simulate light propagation and occlusion.
* Optimized rendering algorithms for **efficient real-time ray calculations** for up to 10,000 rays.
* Implemented **vector math and collision detection** for rendered bodies.
* Designed a **modular codebase**, permitting expansion with new object shapes and light behavior.

**Chess Engine and AI –** [**Github Repository**](https://github.com/mjonsson01/haskell-Chess) Fall 2023

*Collaborative Project*

* Collaborated with a team of five using Haskell to develop a **fully-interactive chess engine** and an **AI opponent.**
* Implemented **decision-tree pruning**, improving move evaluation **performance by 300%**.
* Designed **dynamic depth calculations**, enhancing AI decision-making abilities in **endgame scenarios**.

**Miscellaneous Class Projects and Programming Contributions** Fall 2021 – Present

* Fantasy Football Site: **Flask Web App** with ESPN **web scraping parser**, mass data processing
* Kennel Management Software: **Node Web App** with **MongoDB** for Kennel Management.
* Scala Space Game: Interactive game using **JFX libraries**, rewinding time functionality, dynamic enemy behavior.