Marco Jonsson | San Antonio, Texas

281-818-2906 | marco.e.jonsson@gmail.com | University Github | Personal Github | LinkedIn Profile | Portfolio

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 process at **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 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 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.