# Yu'ban Yoshua Martinez Vasquez

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## Professional Summary

I am a recent graduate in Mechatronics and Robotics Engineering. I am self-taught, passionate about learning new skills and knowledge, especially in programming and robotics.

## Education

**Universidad Interamericana** 2020 - 2024
Mechatronics and Robotics Engineering

**Centro de Investigación en Matemáticas (CIMAT)** 2024 - Present
Master's Degree in Robotics

## Experience

**Instituto Nacional de Astrofísica, Óptica y Electrónica (INAOE), Puebla, México** July 2023 - May 2024
*Social Service and Internship*

- Implementation of the homotopy continuation algorithm in C++ for trajectory planning in autonomous robots.

**EMFUTECH Program, Osaka, Japan** April - July 2023
*Internship*

- Developed 6D-Pose Estimation for object recognition using an RGB-D camera, enabling robotic manipulation.
- Implemented computer vision for object detection, allowing users to select an object via a joystick, triggering an automated search algorithm for precise identification.

## Technical Skills

**Specialization Areas**

- General programming and its application to mathematics and robotics.
- Implementation of artificial intelligence and machine learning in robotics.

**Programming Languages**

- C++, C, Python, ROS

**Tools and Software**

- Ubuntu, Windows, VSCode, Arduino, Spyder, LaTeX, SolidWorks, AutoCAD, Fusion 360

# Projects

**C++ Tool for the Homotopy Continuation Method: A Multi-Disciplinary Approach to Nonlinear Algebraic Equations Systems with Multiple Solutions (Thesis project)**

- Developed a C++ tool utilizing GiNaC for symbolic computation to solve nonlinear algebraic systems through the homotopy continuation method.
- Designed to handle multi-solution problems in robotics and dynamic systems analysis.
- Optimized for computational efficiency and adaptability across different problem domains.

**Simulation of a Differential Mobile Robot in a Polygonal Environment**

- Developed a Python simulation using Pygame to model a differential mobile robot navigating a polygonal obstacle environment.
- Implemented collision detection algorithms ensuring a safe distance from obstacles.
- Integrated the Rapidly-Exploring Random Tree (RRT) algorithm for path planning in complex environments.

**Drone Full Motion Control using MATLAB Simulink**

- Designed and implemented a full control system for a drone, enabling movement along all three spatial axes (X, Y, Z) and stabilization of roll, pitch, and yaw angles.
- Utilized MATLAB Simulink to model and simulate the drone's dynamic response in a 3D environment.
- Applied PID control strategies for precise trajectory tracking, stability, and smooth navigation in three-dimensional space.

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# Certifications

- Emergent Future Technology Program, Mirai Innovation Lab (2023)
- Django: Python Web Development, Educative (2022)
- Object-Oriented Programming in Python, Educative (2022)
- Artificial Intelligence with Python, AiLab School (2021)

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# Languages

- Spanish: Native (C2)
- English: Advanced (C1)