Guillermo Romeo Cepeda Medina

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B.S in Engineering Physics- Tec de Monterrey   Average: 90/100 Graduating in 2024

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Recent Projects

Self Driving Vehicle 2021 - present

- Currently working as the leader of a self-driving vehicle team in VantTec, a student group organization in Tec de Monterrey focused on research and autonomous vehicles development. I am currently investigating new techniques on the perception and localization section of the project, as well as developing software and algorithms to enable the vehicle to locate itself on the road. Specifically, I made a method for depth estimation using ArUco Markers to implement sensor fusion with other sensors such as Lidar and an IMU. Additionally, I have implemented various sensors and algorithms utilizing the ROS2 package NAV2 (C++,Python).

Depth Estimation by Known Polygons with Computer Vision 2021 - present

- Using computer vision and taking advantage of the properties of ArUco, a mathematical function for depth estimation was developed, with the primary objective of using it in a self-driving car. I performed an experiment where I found a relation within depth and area of the Aruco Marker, then made a program that had as an output the distance between a camera and the marker at any given time when in frame.

Artificial Intelligence projects 2023-present

- I am currently developing a project in collaboration with professors of my institution for solving some common problems in the schoolroom, assistance, number and location of available desks, translation of the teacher voice to text, etc.
- Currently working with YOLOv8 and opencv for detection and depth estimation of different objects.

ICPC Programming Tournament 2022 - present

- I have formed part of an ICPC-ACM team and participated in each ICPC tournament since 2022 and am currently preparing myself by solving competitive programming problems in the codeforces platform for the next competition in November of the present year.

Physics Simulations 2020-present

- Developed simulations of complex physics phenomena, such as the simulation of a betatron, a volcano eruption, the evolution of an economic system, the Solar System and the non-relativistic interaction between planets. (Matlab, Python, C++). Currently working on a simulation of the deviation of a light beam on a slit and interferences in quantum pens. (Python, C++).

Work Experience

Software Engineer Intern, ZF Group 2022 - 2023

- Worked as a software engineer intern in ZF Group. I developed software for autonomous vehicles in various platforms and languages. (C++, Python, Matlab and ROS.). Specifically, I developed computational and mathematical methods for perception and localization of self-driving vehicles as well as search algorithms for route navigation.

Web developer 2023 - present

- Currently working with an independent team of web developers as a backend developer, creating solutions for companies like "Enviadero". (Python with Django framework,HTML)

Technical Skills

Programming languages: C/C++, Python, Matlab, ROS/ROS2, R .

Programming Skills: Object oriented programming, data structures, data science, computational thinking for problem solving, dynamic programming, computer vision, Backend development, embedded systems.

Other Skills: Flutist in the Symphonic TEC Orchestra. I have studied flute for more than 12 years and have been part of the orchestra since 2017. Also leading a SUMO team with the SMALC group.