

# Hortencia Alejandra Ramírez Vázquez

M.S. in Computer Science Student

Monterrey, Mexico

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## EDUCATION

### Tecnológico de Monterrey

M.S. in Computer Science

Monterrey, Mexico

Expected graduation: Jun 2026

- Start Date: Aug 2024    GPA: 96/100    Awards: Scientific Program Scholarship
- Thesis topic: Robotic Surface Defect Inspection Using 3D Gaussian Splatting Reconstruction

### Tecnológico de Monterrey

B.S. in Robotics and Digital Systems

Monterrey, Mexico

Aug 2020 - Jun 2024

- Leaders of Tomorrow Scholarship Award    GPA: 98/100    Awards: Mention of Excellence, Class 2024.
- Relevant courses: Programming of Data Structures and Fundamental Algorithms, Object-Oriented Programming, Integration of Robotics and Intelligent Systems.

## EXPERIENCE

### John Deere

Embedded Software Intern

Monterrey, Mexico

Feb 2024 - Jun 2024

- Maintenance and support of Vehicle Network System database, working with CAN and J1939 protocols, analyzing, designing, building, testing, and deploying highly integrated complex solutions.

### Inria

Research Intern

Nancy, France

Sep 2023 - Dec 2023

- Enhancing robot hand pose using Azure Kinect SDK sensor and visual markers tracking for object manipulation with Tiago for the EUROBIN project at Larsen Team.
- Developed a visual servoing using ROS, AprilTag library, C++, and Docker.
- 🌐 Visual-Servoing-Tiago

### Vanttec

Software Developer

Monterrey, Mexico

Aug 2022 - Aug 2023

- Developed a software prototype for object detection in an Unmanned Underwater Vehicle using YOLOv5, ROS and Python. (Awarded in software prototype category at Expo Ingenierías 2022)
- Performed PCB assembly.

## PUBLICATIONS & POSTERS

**Development of a Virtual Environment using 3D Gaussian Splatting for Learning Robot Perception at Higher Education**    Jul 2025

- Arturo E. Cerón-López, Hortencia A. Ramírez-Vázquez, Francisco J. Ramírez-Aldaco, Oscar Cárdenas-Gómez, et al.
- Advanced Robotics and Its Social Impacts (ARSO), 🌐 paper

**Infrastructure Inspection with Robots and 3D Reconstruction Methods: A Comparative Study of Computer Vision Algorithms**    May 2025



- Hortencia A. Ramírez-Vázquez, Max Pacheco-Ramírez, Andrea M. Salcedo-Vázquez, Arturo E. Cerón-López
- International Conference on Robotics and Automation (ICRA), 🌐 poster

**Trial on 3D Gaussian Splatting for Emulating Real-Life Learning Experiences in Undergraduate Educational Robotics**    Sep 2024

- Arturo E. Cerón-López, Jason A. Castaño-López, José G. Buenaventura-Carreón, Oscar Cárdenas-Gómez, Juan C. Hernández-Ríos, José A. León-Navarro, Max Pacheco-Ramírez, Hortencia A. Ramírez-Vázquez, Andrea M. Salcedo-Vázquez
- International Conference on Robotics and Automation (ICRA), 🌐 extended abstract

**Análisis bioinformático de genes diferencialmente expresados involucrados en el desarrollo de cáncer de colon**    Sep 2021  
(*Bioinformatic analysis of differentially expressed genes in colon cancer*)


- Frida Cano F., Gala Flores G., Hortencia A. Ramírez V., Gabriela Cortés O., Harumi C. Manzano Y., Diana P. López E., Leonardo M. Cañete, Aurora A. Pérez.

-  Revista de la Sociedad Mexicana de Biotecnología y Bioingeniería 2021, p.403, ISSN: 0188-4786,  poster

## PROJECTS

### **Designed of an Autonomous Vehicle**

Jun 2023

- Developed an algorithm for a mini autonomous vehicle with a jetson nano, integrating PID controllers for a line follower robot using ROS, RViz and Gazebo.
- Trained an object detection model for traffic lights and signals detection using YOLOv5 and Python.
-  Autonomous Vehicle

## SKILLS

Programming and Frameworks: C++, Python, PyTorch, SQL, ROS/ROS2, Linux, Docker, WSL, GIT, Shell, Matlab

Simulations: RViz, Gazebo      Computer Vision: OpenCV, YOLOv5, Gaussian Splatting

Languages: *English* - **ADVANCED**      *Spanish* - **NATIVE**