David Israel Vázquez Leal

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EDUCATION

Instituto Tecnológico de Estudios Superiores de Monterrey (ITESM) — August 2021 - June 2025
96.7/100 and Ceneval's EGEL Excellence Performance Award

Bachelor of Engineering in Robotics and Digital Systems

WORKING EXPERIENCE

AIST IRCAM (Integrated Research Center for Advanced Manufacturing) — Odaiba, Tokyo, Japan
Technical Staff (Robotics engineer) — September 2025 - Present

- Integration of **navigation, manipulation and perception technologies** for mobile manipulators
- Design of **autonomous manipulation pipelines** for graspings

CNRS-AIST JRL (Joint Robotics Laboratory) — Tsukuba, Ibaraki, Japan
Technical Staff — September 2024 - January 2025

- Design of a **semi-autonomous manipulation pipeline** for a mobile manipulator
- Performed **autonomous** graspings in shelves using point cloud filtering and concatenation through PCL library
- **Integration** of MoveIt 2, Intel Realsense, UR5e manipulator, and Robotiq gripper through ROS2 packages and Docker
- **First author of a paper submitted to IEEE/SICE SII 2026**: *"Development of a semi-autonomous manipulation pipeline for robotic shelf-picking operations"* (under review)

Roborregos — Monterrey, Nuevo León, México
Electronics developer and programmer — November 2022 - June 2025

- **2nd place** in Mexican Robotics Tournament in @Home competition in 2024 and 2025
- Participated in **Robocup @Home** competition in 2024 (Eindhoven, Netherlands)
- **Project Manager** (PM) of electronics and navigation areas
- **Co-first author of a paper submitted to IEEE/SICE SII 2026**: *"Software Toolkit for RoboCup@Home: A Modular and Hierarchical Architecture for Service Robots"* (under review)

MAIN PROJECTS

RoboCup @Home — Monterrey, Nuevo León, México
Service Robot Competition — February 2023 - June 2025

- Successful use of **XArm6 SDK** (Software Development Kit) through **custom ROS services** to achieve autonomous path following with **stabilized end effector**
- Implementation of **embedded PID controller** in Atmega2560 chip to achieve precise omnidirectional movements in a custom base
- Use of **Gazebo** and **ROS** to simulate and implement **Navstack 1 & 2** in a customized omnidirectional robot
- Successful use of **Gmapping** and **AMCL** with **LIDAR**, **IMU** and encoders for autonomous navigation in real environments

Self-Driving Vehicle — Monterrey, Nuevo León, México
VantTec and ZF Friedrichshafen SDV — March 2023 - August 2024

- Programmed the control for a **full-scale autonomous braking system** using **CAN protocol** with **STM32**
- Designed a **fault-tolerant PCB** based on STM32 with **embedded CAN transceivers** to control NEMA 34 steppers for **steering and braking actions in a functional vehicle**

SKILLS

PROGRAMMING LANGUAGES

4 years: C++/C
4 years: Python
1 year: Matlab

USED CADs FOR PCBs

5 years: Easy EDA
1 month: Altium
7 months: KiCAD

TECHNOLOGIES

Robotic Operating System (ROS & ROS2), STM32, ESP32, FreeRTOS, I2C, CAN, USART, SPI, Gazebo, SLAM, AMCL, Navstack 1 & 2, LIDAR, XArm6, Docker, UR5e, Robotiq Gripper, Ubuntu, Github, Docker, ZED, Doxygen, Sphinx

LANGUAGES

- Spanish (native)
- English (B2 level)