Diego Andres Carvajal Solano

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DiegoCarvajal98

PROFILE

Mechatronics Engineer with hands-on experience designing and integrating robotic systems, specializing in both robotic arms and mobile wheeled robots, leveraging strong expertise in ROS with Python and C++. My passion lies in solving complex challenges through programming and systems design, creating robust solutions that enhance efficiency and effectiveness.
I have a proven track record in sensor and actuator integration, hardware-software integration, and developing software for robotic platforms. I am proficient with industrial components, such as PLCs and HMIs, and have solid experience in electronics, which ensures a comprehensive approach to system development.
I am a collaborative team player with a passion for continuous learning and problem-solving. I am eager to apply my skills to innovative and challenging projects in robotics and automation.

SKILLS

Programming
Linux, Python, C++, Git, Docker, Matlab, OpenCV, YOLO, Qt, pyQt

CAD and Simulation
Gazebo, Solidworks, Simulink, Autodesk Inventor, Proteus, Comsol Multiphysics

Robotics
ROS 1/2, MoveIt, Nav2, Robotics teleoperation, Robotics integration, Arduino

Other Skills
Prototyping, Research, Continuous improvement, Communication

Automation
PLC programming, Siemens PLC, Delta, Instrumentation, Control, Networking, EthernetIP, CANOpen

RELEVANT EXPERIENCE

Innovation and Development Engineer 08/2023 – 10/2025
Automate Col Medellin, Colombia

During my time at AutomateCol, I was involved in key robotics and automation projects that enhanced my technical and problem-solving skills.

- Led the development of a wheeled mobile robot, implementing autonomous navigation and mapping using ROS 2, and incorporated autonomous charging capabilities with behavior trees, enhancing operational efficiency and reliability.
- Contributed to developing a machine for packaging flower bouquets into buckets by programming PLCs and HMIs to automate the process, and integrated a UR20 robotic arm to streamline operations, improving efficiency.

These projects helped solidify my expertise in robotics software, PLC programming, and system integration while allowing me to work across both hardware and software domains.

Research Intern 07/2022 – 11/2022
Grupo de Investigación en Control y Mecatrónica Bucaramanga, Colombia

Developed a system for pick and place applications using a UR3 robot controlled by EEG data with ROS and Matlab, enhancing automation capabilities

EDUCATION

Bachelor of Engineering, Mechatronics Engineering 01/2018 – 04/2023
Universidad Autónoma de Bucaramanga Bucaramanga, Colombia

PROJECTS

Teleoperation System for a Robot Manipulator with Gripper Haptic Feedback 01/2022 – 11/2022
During this project, I developed a teleoperation system or a UR3 robot manipulator using my programming skills with python and C++ to estimate the pose of the user's hand and control the robot and its gripper with ROS, my hardware design skills for the design of the electronics and mechanical components needed in the haptic tool and gripper force sensing systems.

Control of a Robot Manipulator with EEG Data for Object Manipulation Tasks 07/2022 – 11/2022
Throughout the development of this project, I used my programming skills with python and C++ as well as Matlab to program a UR3 robot manipulator to pick one of five possible objects according to the result from a machine learning model and Brain-Computer Interface data and place it at a determined location using ROS for the robot control and object detection.

PUBLICATIONS

Revisión del uso de interfaces cerebro-computador con el paradigma de Potenciales Evocados Visuales en Estado Estable en el control de robots manipuladores 10/30/2023
Editorial Unimar
Article presented at the CIIMA 2022 comference.

LANGUAGES

Spanish
Native

English
Proficient Speaker (B2)

Korean
Competent in basic Korean

AWARDS

UNRobot 2021 Challenge Winner 11/22/2021
Ceintum-RAS Group
Winner of the UNRobot Challenge in the Intermediate Simulation category, this challenge consisted of developing and implementing an obstacle avoidance strategy for a differential robot through Matlab simulation.

COURSES

Learn to Code in Python3: Programming beginner to advanced
Udemy

Code Foundation for ROS Path
The Construct
Basic Linux and Python concepts for ROS Programming.

ROS for Beginners Path
The Construct
Basic ROS concepts, Navigation, Manipulation and Control with ROS.

ROS for Beginners: Basics Motion and OpenCV
Udemy

ROS for Beginners II: Localization, Navigation and SLAM
Udemy

C for Everyone: Programming Fundamentals
Coursera

Applied Dynamics Bucaramanga, Colombia
Universidad Autónoma de Bucaramanga
Through this course I learned kinetic and kinematic analysis of multi-body systems, applying these concepts to the analysis of a 3D printed 5 DoF robot manipulator.
Course ID: 18017

Finite Elements Bucaramanga, Colombia
Universidad Autónoma de Bucaramanga
Through this course I learned the concepts of Finite Element Analysis as well as FEA Simulation using Comsol applying these concepts to the static and dynamic stress and strain analysis of a 3D printed 5 DoF robot manipulator.
Course ID: 18022

ADDITIONAL WORK EXPERIENCE

Customer Service Agent 01/2023 – 07/2023
Foundever

Robot Supervisor 01/2022 – 12/2022
Kiwibot Colombia