Cristian Bautista

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Research Interests

Graduate Research Assistant at the **Center for Automotive Research (CAR), The Ohio State University**. My research focuses on **Autonomous Systems, Multi-Agent Perception and Reinforcement Learning**. I am particularly interested in developing robust decision-making and perception frameworks for safety autonomous systems.

Education

The Ohio State University, Columbus, OH — Aug. 2024 – Aug. 2026

M.S. in Electrical and Computer Engineering — GPA: 3.7 / 4.0

Coursework: Reinforcement Learning (A), Learning-Based Control (A), Convex Optimization (A-), Robotics (A)

Advisors: Prof. Wei-Lun Chao, Prof. Qadeer Ahmed

Universidad Santo Tomás, Tunja, Colombia — 2015 – 2021

B.S. in Electronic Engineering — GPA: 4.4 / 5.0

Highest Honors Graduation: Cum Laude & Laureate Thesis Award

Advisor: Prof. Camilo Pardo

Relevant Coursework: Computer Vision (A), Intro to Machine Learning (A)

Research Experience

Graduate Research Assistant — **The Ohio State University**

Research Projects — *Summer 2025–Present*

- **Collaborative 3D Perception:** Implemented unsupervised 3D object detection for multi-agent collaborative perception.
- **RL-based Maneuver Decision-Making:** Designing RL agents for Robotaxi mission in a stochastic, partially observable environments using Deep Reinforcement Learning.

Buckeye AutoDrive Challenge — **The Ohio State University**

Team Captain & Mobility Innovation Leader — *2024–Present*

- Led the end-to-end integration of a Level-4 AV stack with safety-critical and robust behavior for real-world deployment.
- Developed an optimized sensor suite for robotaxi use-cases, under adverse weather conditions.
- Collaborative driving approach to mitigate misdirection from traffic agents; **Oral presentation** at *SAE WCX 2025* (Detroit, MI).

Universidad Santo Tomás — **Tunja, Colombia**

Plum Selection System (Undergraduate Thesis) — *2019–2021*

- Deep Learning approach to classify plums by morphology/visual features; optimized via data augmentation and Grad-CAM.
- Real world robotic system implementation to plum selection using Deep Learning.

Publications

Learning to See a City Without Labels: Can Many Roadside Specialists Train a Generalist Ego-Vehicle 3D Detector?

Cristian Bautista[*], Zhen Xu[*], Jinsu Yoo[*], Zanming Huang, Tai-Yu Pan, Zhenzhen Liu, Katie Z Luo, Mark Campbell, Bharath Hariharan, Wei-Lun Chao. *(*equal contribution)*

IEEE/CVF Conference on Computer Vision and Pattern Recognition ***CVPR 2026*** (*Under Review*)

SmartCityZero: Label-Free 3D Perception through RSU-to-Vehicle Collaboration

Cristian Bautista*, Zhen Xu*, Jinsu Yoo*, Zanming Huang, Wei-Lun Chao.

International Conference on Computer Vision ***ICCV 2025*** *Workshop X-Sense*

A Plum Selection System that Uses a Multi-class Convolutional Neural Network (CNN).
Cristian Bautista*, Yesid Fonseca*, Camilo Pardo, Carlos Parra.
Journal of Agriculture and Food Research (2023).

Plum Selection System using Computer Vision.
Cristian Bautista*, Yesid Fonseca*, Camilo Pardo.
IEEE ANDESCON (2020)

Teaching Experience

Universidad Santo Tomas **Tunja, Colombia**
Teaching Assistant – Fourier Analysis *Fall 2019, Spring 2020*
Give lectures, held office hours and assist the laboratories over 50 undergraduate students. Topics included Fourier series, Fourier transforms, and applications in signal processing.

Industry Experience

Cummins Inc. & Center for Automotive Research **Columbus, IN & Columbus, OH**
Research Project *Summer 2025*
- Contributed to regulatory compliance & functional safety alignment for automotive embedded systems.
- Supported AUTOSAR-based software architecture and requirements traceability workflows (ALM).
- Assisted in verification/validation of ISO 26262 safety-critical requirements.

Technip Energies **Bogotá, Colombia**
Instrumentation & Automation Specialist I (Full-time) *2022–2024*
- Led procurement and integration of pressure/temperature instrumentation for an European biofuels plant.
- Collaborated with global suppliers to evaluate, select, and validate industrial instrumentation.
- Designed process and pneumatic hook-up diagrams for Industrial sensors and air distribution systems

Awards & Recognition

2025: **Promoted as Team Captain** — Buckeye AutoDrive (Year 5). Leading a team of over 50+ undergraduate and graduate students toward developing a fully autonomous Level 4 vehicle.

2025: **3rd Place, Mobility Innovation** — AutoDrive Challenge II (Year 4). -A prestigious North American competition on autonomous vehicle development, sponsored by SAE International and General Motors.

2023: **Colfuturo Scholarship**: Prestigious award supporting graduate studies abroad.

2022: **Opportunity Funds Program**: U.S. Department of State fellowship for high-potential students pursuing graduate studies in the U.S.

2021: **Cum Laude, Laureate Thesis Award**: Highest undergraduate honors, Universidad Santo Tomás.

2018-2019: **Merit-based Scholarship**: Outstanding academic performance.

2018: **International Exchange Scholarship**: Universidad Privada de Tacna, Peru.

Technical Skills

Programming: Python, C++, MATLAB, ROS2, Git, Bash

ML/AI: PyTorch, TensorFlow, OpenCV, Open3D

Perception: LiDAR, Radar, Cameras, V2X; multi-sensor fusion & calibration

High-Performance Computing: OSC: Slurm, multi-node GPU/CPU jobs, CUDA

Languages: Spanish (Native), English (Full Proficiency)