

Cristian Bautista

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SUMMARY

Ph.D. student in Electrical and Computer Engineering at The Ohio State University with experience in label-free and collaborative 3D perception and full-stack autonomous vehicle integration. Research interests include learning-based decision-making and Vision-Language-Action models for autonomous driving.

EDUCATION

The Ohio State University, <i>Ph.D. in Electrical and Computer Engineering</i> Advisors: Qadeer Ahmed ✉ , Ekim Yurtsever ✉	May 2026 – Expected May 2030 GPA:
The Ohio State University, <i>M.S. in Electrical and Computer Engineering</i> Selected Courses: Reinforcement Learning (A), Autonomy in Vehicles (A), Robotics (A), Online Learning & Optimization (A-) Advisors: Wei-Lun Chao ✉ , Qadeer Ahmed ✉	Aug 2024 – May 2026 GPA: 3.56 / 4.0
Universidad Santo Tomás, Tunja, Colombia <i>B.S. in Electronic Engineering</i> Minor in Computer Vision and Machine Learning Graduated with Highest Honors	Feb 2016 – Jun 2021 GPA: 4.4 / 5.0

SELECTED PUBLICATIONS

Zhen Xu*, Jinsu Yoo*, **Cristian Bautista***, Zanning Huang, Tai-Yu Pan, Zhenzhen Liu, Katie Z. Luo, Mark Campbell, Bharath Hariharan, and Wei-Lun Chao. “*When the City Teaches the Car: Label-Free 3D Perception from Infrastructure.*” European Conference on Computer Vision (ECCV), 2026; CVPR DriveX Workshop, **Best Poster Award**.

Cristian Bautista, Andrei Kopanav, Qizhe Xu, Xinyu Ma, Jiyao Yuan, Sooyoung Jeon, Derin Durak, Tian-Le Dai, Yuxin Xiao, Rocky Shao, Shengzhe Tan, Gowrav Mannem, Raya Qureshi, Jinsu Yoo, Lisa Fiorentini, Wei-Lun Chao, and Qadeer Ahmed. “*BRUTUS: A Full-Stack Autonomous Driving Platform in the Robotaxi Era.*” In Submission for the *Journal of Field Robotics*, 2026.

Zhen Xu*, **Cristian Bautista***, Jinsu Yoo*, Zanning Huang, and Wei-Lun Chao. “*SmartCityZero: Label-Free 3D Perception through RSU-to-Vehicle Collaboration.*” ICCV X-Sense Workshop, 2025.

Cristian Bautista*, Yesid Fonseca*, Camilo Pardo, and Carlos Parra. “*A Plum Selection System that Uses a Multiclass Convolutional Neural Network.*” *Journal of Agriculture and Food Research*, 2023.

*Equal contribution.

HONORS & AWARDS

2026: Best Poster Award — CVPR DriveX Workshop

2025–2026: SAE AutoDrive Challenge II — Buckeye AutoDrive

- **Two-time 3rd Place**, Mobility Innovation (2025, 2026) (Leader & Presenter)
- **2nd Place**, MathWorks Simulation Challenge (2026) (Team Captain)
- **3rd Place**, Overall Static Events (2026) (Team Captain)
- **3rd Place**, System Safety (2026) (Team Captain)

2023: Recipient of the **COLFUTURO Scholarship** — Colombian Ministry of Science, Technology and Innovation

- 2022: Recipient of the **Opportunity Funds Program** — *U.S. Department of State*
- 2021: Highest Honors Graduation **Cum Laude and Laureate Thesis Award** — *Universidad Santo Tomás*
- 2018–2019: Recipient of a **Merit-Based Scholarship** — *Universidad Santo Tomás*
- 2018: Recipient of an **International Exchange Scholarship** — *Universidad Santo Tomás*

RESEARCH EXPERIENCE

- The Ohio State University**
Graduate Research Associate

Columbus, OH
Summer 2025 – Present
- **Label-Free and Collaborative 3D Perception:** Developed infrastructure-to-vehicle collaboration methods for label-free 3D object detection, leveraging roadside sensors to improve ego-vehicle perception without manual annotations.
 - **Learning-Based Decision-Making:** Designed hierarchical deep reinforcement learning agents for decision-making and path planning in simulated urban robotaxi missions.
- Buckeye AutoDrive, The Ohio State University**
Team Captain (Oct. 2025–Jun. 2026) & Mobility Innovation Lead

Columbus, OH
Aug. 2024 – Jun. 2026
- Led a multidisciplinary team of 40+ students in the development, integration, and real-world deployment of BRUTUS, a full-stack autonomous research vehicle.
 - Led end-to-end integration across multimodal perception, localization, path planning, control, distributed computing and CAN-based vehicle interfaces.
 - Developed MILP-based sensor-suite optimization and collaborative-driving concepts to mitigate misdirection from traffic agents, earning 3rd Place in Mobility Innovation in 2025; Oral presentation at SAE WCX 2025.
 - Led the development of a Vision-Language-Action concept to improve passenger experience and AV transparency, earning 3rd Place in Mobility Innovation in 2026.
- Universidad Santo Tomás**
Plum Selection System — Undergraduate Thesis

Tunja, Colombia
2019–2021
- Developed a multiclass CNN to grade plums using morphological and visual features, incorporating data augmentation and Grad-CAM for model analysis and interpretability.
 - Integrated the trained model into a real-world robotic sorting system for automated fruit classification and handling.

INDUSTRY EXPERIENCE

- Cummins Inc. & Center for Automotive Research**
Automotive Embedded Systems Research Project

Columbus, OH
Summer 2025
- Analyzed AUTOSAR-based embedded software architectures to support alignment with automotive functional-safety requirements.
 - Mapped ISO 26262 safety requirements to verification artifacts and supported end-to-end requirements traceability through application lifecycle management (ALM) workflows.
- Technip Energies**
Instrumentation & Automation Specialist I

Bogotá, Colombia
2022–2024
- Led the specification, procurement, and integration of pressure and temperature instrumentation for a European biofuels plant.
 - Coordinated with global suppliers to evaluate technical proposals and validate industrial instrumentation against process and project requirements.
 - Produced process and pneumatic hook-up diagrams for field instrumentation and instrument-air distribution systems.

TECHNICAL SKILLS

- Programming & Systems:** Python, C++, MATLAB, Bash, Linux, Git, Slurm, GPU/CPU computing
- Software & Libraries:** PyTorch, TensorFlow, ROS 2, OpenCV, Open3D, CUDA, CARLA
- Autonomous Systems:** 2D/3D perception, Multi-agent perception, End-to-end integration
- Topics:** Reinforcement learning, Optimization, Machine Learning, Unsupervised 3D Detection, Vision-language-action models, Online Learning (Multi-arm bandits, UCB, EXP3)
- Languages:** English (full professional proficiency), Spanish (Native)

TEACHING EXPERIENCE

Universidad Santo Tomás

Tunja, Colombia

Teaching Assistant, Fourier Analysis

Fall 2019 – Spring 2020

- Delivered lectures, held office hours, and supported laboratory sessions for 50+ undergraduate students, covering Fourier series, Fourier transforms, and signal-processing applications.

PROFESSIONAL SERVICE

2026: Reviewer, *DriveX Workshop at ECCV 2026*

2026: Reviewer, *23rd IFAC World Congress*