Nicolás Llanos Neuta

+57 3217824481 — nicolas.llanos.neuta@gmail.com — linkedin — neuta — web

Applied Scientist — AI/Robotics Engineer

Computer scientist and robotics researcher with a passion for the art of integration — where AI, Computer vision, and sensor fusion converge into intelligent systems.

Skills

Programming	Python 3+, C/C++/C#, R, Java, Matlab, Simulink, Shell Command (sh)
Frameworks/Libraries/Tools	ROS, ROS2, OpenCV, gitHub, LaTeX, Docker, PCL, Open3D
Machine Learning	PyTorch, Tensorflow, Keras, Sklearn, Pandas, SQL
Design	Figma, CorelDraw, Photoshop
Computer Aided Design	SolidWorks, SolidEdge, AutoCAD, Autodesk Inventor
Webdev	HTML, CSS, JavaScript, Flask
OS/Platforms	Ubuntu, Debian, Jason Orin/Nano
Languajes	Spanish (native), English (B2)

Education

PhD(c) in Engineering — Feb 2019 – Nov 2025

Red Mutis (Universidad Autonoma de Occidente, Colombia) — Cali, Colombia — *GPA: 4.6/5.0*

Thesis: End-to-end sensory fusion for simultaneous tracking and classification of multiple objects in dynamic environments

Supervisor: Victor Romero-Cano (Cardiff University)

Co-Supervisor: Juan C. Perafan-Villota (Johns Hopkins University)

B.Sc in Mechatronics Engineering — Jul 2016 – Nov 2018

Universidad Autonoma de Occidente— Cali, Colombia Colombia — *GPA: 4.0/5.0*

Thesis: Design and implementation of a system based on machine learning that facilitates the robotic perception of the environment through laser sensors

Mechatronics Technology — Jan 2013 – Nov 2015

CECEP — Cali, Colombia — *GPA: 4.0/5.0*

Thesis: Design and construction of a waste compaction and classification machine

Relevant MOOCs

XR Vivero Virtual (Universidad de los Andes-Nov 2023)

Deep Learning Specialization (Coursera-2021)

Certifications

- Neural Networks and Deep Learning
- Structuring Machine Learning Projects
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization
- Convolutional Neural NetworksConvolutional Neural Networks
- Sequence Models

Research Interest

Multi-Modal Learning, Multi-Task Learning, Representation Learning, VLM/LLM, Computer Vision, Robotics

Experience

Universidad Autónoma de Occidente — Cali, Colombia — *Ago 2023 – Jun 2025*

Academic Lecturer - Instructor 1

- *Lectured courses within the Faculty of Engineering and Basic Sciences.*
- *Coordinated the Algorithm and Programming courses, overseeing content delivery and academic planning.*
- *Supervised and evaluated undergraduate thesis projects in Mechatronics, Informatic, and Multimedia Engineering.*
- *Participated in the formulation of research projects such as virtual agents and AI-based tools to improve programming education.*

Universidad Santiago de Cali — Cali, Colombia — *Oct 2024 – Jul 2025*

Co-Researcher

Project: Prediction of Biogas Production Scenarios through the Analysis of Microbial Structures during the Co-Digestion of Agro-Industrial Waste

- *Developed a dataset integrating multiple variables related to biogas production scenarios, with verified data acquisition procedures and feature engineering.*
- *Developed predictive models using machine learning and deep learning techniques to estimate methane production in co-digestion processes.*

Massachusetts Institute of Technology (MIT)— Cambridge, USA — *Jul 2023*

Academic Research Internship – Senseable City Lab

MISTI Program (MIT International Science and Technology Initiatives)

Project: FLATBURN – The Open-Source City Scanner

- *Implemented and assembled the FLATBURN platform using additive manufacturing techniques.*
- *Integrated multiple environmental sensors into the system for data collection.*
- *Deployed and tested the platform in the streets of Cambridge, Massachusetts, for urban data acquisition and system evaluation.*

Universidad del Valle — Cali, Colombia — *May 2023 – May 2025*

Research Intern

Project: Autonomous driving system for the experimental development of an electric vehicle prototype in the automotive sector of the Valle del Cauca department.

- *Designed and implemented a multi-sensor platform integrating cameras, LiDAR, IMU, and GPS for environment reconstruction and robotic perception tasks.*
- *Carried out extrinsic and intrinsic calibration of exteroceptive sensors to enable accurate sensor fusion and spatial alignment.*
- *Developed a structured methodology for acquiring a custom urban dataset tailored to the conditions of developing countries.*

Universidad Autónoma de Occidente — Cali, Colombia ***Jul 2021 – Jul 2022***
Massachusetts Institute of Technology (MIT)
Co-Researcher
Project: Barrios 4D: Using LIDAR and machine learning to unravel the mathematical morphological rules of informal settlements in Cali, Colombia (Grant: MIT-Colombia Cali Seed Fund — MIT)

- *Developed a system for urban object detection and characterization using LIDAR data.*
- *Implemented object tracking algorithms for 3D scans.*

Universidad Autónoma de Occidente — Cali, Colombia ***Feb 2019 – Jul 2023***
Research and Teaching Assistant

- *Supported research and academic activities in the Robotics Laboratory, focusing on intelligent systems and autonomous platforms.*
- *Lectured and assisted in engineering courses related to robotics, computer vision, and computational modeling, guiding students in theoretical concepts and practical implementation using engineering tools.*
- *Assisted students in laboratory sessions, guided project development, and contributed to the design of didactic materials and experimental setups.*

SIDELVA S.A.S — Cali, Colombia ***Nov 2015 – Jan 2016***
CAD Design Intern

- *Designed and updated 2D and 3D mechanical components using CAD software (SolidWorks, AutoCAD).*
- *Created technical drawings and assembly layouts for manufacturing and documentation purposes.*

ODECOPACK S.A.S — Cali, Colombia ***Jan 2015 – Sep 2015***
Automation and Control Intern

- *Read and interpreted electrical schematics for system implementation*
- *Programmed Siemens and Allen-Bradley PLCs, including Siemens LOGO controllers*
- *Assembled and installed distribution and automation boards*
- *Configured and mounted soft starters, frequency drives, and protection equipment.*

Teching, Student Supervision, Service

Courses

- ***Multimedia Design**: Focused on the design and implementation of multimedia software systems, applying software architecture patterns, risk assessment, technology selection, and agile development methodologies.*
- ***Digital Image Processing**: Focused on classical image processing techniques and modern approaches using machine learning, deep learning, and generative modeling.*
- ***Algorithms and Programming**: Focused on the analysis, design, implementation, and evaluation of algorithms using Python, with applications to engineering problems.*
- ***Robotics perception**: Focused on environment understanding for mobile robots through camera and LiDAR data, covering 3D reconstruction, object detection, multi-object tracking, and multi-sensor fusion techniques using the ROS middleware.*
- ***Robotics**: Focused on the principles of forward and inverse kinematics, modeling of robotic manipulators and mobile robots, and practical implementation using the ROS.*
- ***Computational Tools for Engineering**: Focused on the simulation and modeling of engineering systems using Python, MATLAB, and Simulink, with an emphasis on engineering cases, data analysis, and representation of dynamic systems.*

Student Supervision — B.Sc Thesis in Engineering

- *Design of a telemetry and recovery system for an unguided rocket.*
- *Software architecture system for person recognition and tracking in a university environment.*
- *Multimedia system for managing urban security footage: Guardian Aerial Project.*
- *Multiplatform accessibility to the Lili Virtual Museum.*
- *Interactive multimedia system in virtual reality for understanding and applying lighting schemes in photographic training for the professional photography course.*

Evaluator — B.Sc Thesis in Engineering

- *Transitability estimation system for terrestrial mobile robots.*
- *3D Map Construction in Urban Environments Using Sensor Fusion Techniques.*
- *Web application for the management of projects of the Information Technology Department at UAO.*
- *Development of a user interface for the teleoperation of a manipulator robot using virtual reality tools in the Nakama Robotics Laboratory at the University of Twente.*

Publications

Barrios 4D: Semi-Automated morphology analysis of human settlements using mobile laser scanning', Castaño-López, J., Perafan-Villota, J., Llanos-Neuta N., Simone Mora, Romero-Cano V., Sage Environment and Planning B (2025)

Probabilistic Perception System for Object Classification Based on Camera-LiDAR Sensor Fusion. JSO Ceron, VR Cano, NL Neuta, WM Toro. LatinX in AI Research at ICML (2019)

Low-cost recognition and classification system based on LiDAR sensors. NL Neuta, SA Vivas, NV Fajardo, OFR Giraldo, VR Cano. IEEE Colombian Conference on Robotics and Automation CCRA (2018)