

Pedro Domitti de Carvalho

Computer Engineering · AI & Embedded Systems

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Computer Engineering background (PUC-Campinas) and **2 years of R&D experience** at Instituto de Pesquisas Eldorado, building connected-vehicle (V2X) systems end to end, from embedded C on vehicle and roadside units to computer vision and real-time dashboards. Focused on bringing machine learning to embedded and edge systems.

EXPERIENCE

Software Engineer Intern | Instituto de Pesquisas Eldorado Jan 2025 - Present · Campinas, SP
One of Brazil's largest technology R&D institutes · Connected-vehicle (V2X) lab

- Delivered a **CACC (Cooperative Adaptive Cruise Control) communication prototype** for one of the world's largest automakers: real-time data exchange between 2 vehicles through their on-board units (OBUs), reaching **900+ m**. Demoed live at the automaker's facility to **senior executives**.
- Wrote embedded C/C++ for Linux-based C-V2X units: read speed and brake state from **CAN/OBD-II**, fused it with **GNSS**, and broadcast ETSI Cooperative Awareness Messages (CAM) tracking leader/follower state in real time.
- Built the roadside unit (RSU) service in Python that generates traffic-signal messages (SPaT/MAP) and runs **OpenCV + YOLO** pedestrian detection, groundwork for future **AI-driven traffic lights in cities**.
- Work in **Agile (Scrum)** sprints with **Git/GitHub** code review, **Docker**, **CI/CD** pipelines and **Bash** scripting to cross-compile, deploy and test builds on OBUs and RSUs.
- Built the team's test tooling: a **Flask + React/TypeScript** control dashboard, an **MQTT** traffic simulator mixing virtual and real vehicles, and **Linux network-emulation** tooling that reproduces real-world latency and jitter on V2X links.
- Developed **ROS 2** nodes to teleoperate a 6-axis robotic arm with a haptic device (force feedback, joint limits, smoothing), monitored via **Grafana/Zabbix**.

PROJECTS

FloraSense UNDERGRADUATE THESIS 2026
IoT plant-health monitor: **ESP32** sensor nodes stream climate and soil data over MQTT, a **TensorFlow Lite Micro** model scores plant health on-device, and the **Gemini API** flags disease from leaf photos, all shown on a real-time web dashboard.
C++ · Python · TensorFlow / TFLite Micro · Gemini API · MQTT · React · TypeScript · Node.js · MongoDB · Docker

IoTtendance - RFID Attendance System C++ · React · Node.js · MongoDB · WebSockets
Solo project: **ESP32** RFID readers log student attendance in real time to a web dashboard for teachers.

Snake AI - Reinforcement Learning Python · TensorFlow · Gym
Agent trained with a **Deep Q-Network (DQN)** that learns to play Snake autonomously from the game state.

Compiler in C C · lexer · parser · semantic analysis
Compiler for LPD, a didactic programming language, written from scratch in C.

EDUCATION

B.Eng. Computer Engineering | PUC-Campinas 2021 - Dec 2026
Exchange Semester, Computer Science | Vrije Universiteit Amsterdam, Netherlands Aug - Dec 2022
Grade 8.3/10 · **top 7.3% of the cohort** (47th of 650)

SKILLS

AI / ML	Python, PyTorch, TensorFlow / Keras, TensorFlow Lite Micro, scikit-learn, OpenCV, YOLO, NumPy, pandas, CNNs, NLP, reinforcement learning, LLM APIs (Gemini)
Embedded & V2X	C, C++, embedded Linux, kernel modules, ESP32, CAN/OBD-II, GNSS, MQTT, ROS 2, C-V2X, ETSI ITS
Software	TypeScript, JavaScript, React, Node.js, Express, Flask, REST, WebSockets, MongoDB, SQL, Jest
DevOps & Tools	Git, GitHub Actions, Docker, CI/CD, Bash, Linux, Nginx, Wireshark
Languages	Portuguese (native) · English (fluent) · Spanish (basic) · German (elementary)

CERTIFICATIONS

TensorFlow Developer Specialization DeepLearning.AI · 2026	Generative AI Journey with IBM Granite IBM SkillsBuild · 2025	Machine Learning Specialization Stanford & DeepLearning.AI · 2025
Google Prompting Essentials Google · 2026	Writing, Running & Fixing Code in C Duke University · 2025	CS50: Intro to Computer Science Harvard University · 2023