

# Giovanni Claudio

## SENIOR ROBOTICS SOFTWARE ENGINEER

London, United Kingdom

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*Nine years of experience in perception, computer vision, deep learning and sensor-based robot control*

## Experience

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### Senior Robotics Software Engineer

London, UK

ARRIVAL - MOBILE ROBOTICS

Mar 2021 - Now

- Responsible for the vision system of the Autonomous Mobile Robot WeMo (hardware and software).
- Designed and deployed an automated intrinsic and extrinsic parameters calibration process for the WeMo fleet.
- Designed and implemented a vision-based precise positioning method achieving millimetres and sub-degree accuracy.
- Implemented automated tools for camera sub-assembly, calibration and end-of-line robot validation.

### Robotics Engineer - Autonomous Navigation

London, UK

ARRIVAL - MOBILE ROBOTICS

Sept 2019 - Mar 2021

- Developed software for autonomous navigation and simulation of AMRs deployed in the ARRIVAL Microfactory.

### Autonomous Driving Engineer

Turin, Italy

ITALDESIGN GIUGIARO (VOLKSWAGEN GROUP)

Sept 2017 - Sept 2019

- Responsible for the perception and software architecture of the PopUp project: an electric, modular and autonomous flying car.
- Research, implementation and deployment of perception, mapping/localization and control algorithms.
- Training and deployment of deep neural networks for object detection and semantic image segmentation.
- Machine Learning and Computer Vision technical lead of InTo: service that improves travel on the metro.
- Developed perception system for obstacle and free navigable space detection for Wheem-i and Roborace.
- Sensor scouting and evaluation (mainly cameras, lidars and depth cameras).

### R&D Robotics Engineer

Rennes, France

INRIA, LAGADIC TEAM, LEAD BY FRANÇOIS CHAUMETTE

Nov 2013 - Aug 2017

- Implemented sensor-based algorithms on drones, mobile, serial and humanoid robots for navigation and manipulation.
- Developed detection, real-time tracking and pose estimation algorithms using 2D and RGB-D cameras.
- Built a framework based on ROS, MATLAB/Simulink, and V-REP for a fast prototyping of robot control algorithms.
- Supervised student internships and published scientific articles at ICRA'17 and Humanoids'16.
- Organized demonstrations to show the robotic platforms to the general public.

### Robotics Engineer Internship

Nantes, France

IRCCYN

Feb - Sept 2013

- Developed a C++ algorithm to estimate the pose and velocity of a high-speed parallel robot using vision.
- Designed a visual system with high-performance CoaXPress cameras (reached an acquisition frame rate of 2 kHz).

## Education

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### Master ARIA (Control Engineering, Robotics and Applied Informatics): Advanced Robotics

Italy and France

DOUBLE DEGREE: ÉCOLE CENTRALE DE NANTES (ECN) AND UNIVERSITY OF GENOA (UNIGE)

2011-2013

### Bachelor's Degree in Computer Science Engineering

Italy

UNIVERSITY OF GENOA (UNIGE)

2008-2011

### Self-Driving Car Engineer Nanodegree (SDCN)

Udacity

MODULES 1 AND 2 - IN COLLABORATION WITH MERCEDES-BENZ, NVIDIA, BMW AND UBER

Feb-Nov 2017

## Skills

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<b>Programming</b>	C++, Python, MATLAB
<b>Libraries</b>	OpenCV, PCL, Tensorflow
<b>Tools and Software</b>	GIT, CMake, Doxygen, Docker, Kubernetes, AWS S3, ROS, Simulink
<b>OS</b>	GNU/Linux, Microsoft Windows
<b>Robots</b>	Self-Driving vehicles, Mobile robots, drones, humanoid robots and manipulators
<b>Sensors</b>	Camera, Depth Camera, Lidar, Radar, Ultrasonic, IMU, GNSS
<b>Languages</b>	Italian ( <i>Native</i> ), English ( <i>Fluent</i> ), French ( <i>Intermediate</i> ), Spanish ( <i>Basic</i> )

## Projects and Software

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### InTo

*Italdesign*

A SERVICE TO PREDICT THE LEAST CROWDED CAR ON THE METRO USING AI

C++

- The system analyzes data coming from on-board and station cameras and it relies on:
  - Convolutional Neural Network for crowd estimation and people counting.
  - Machine learning algorithm to predict the people exiting from the train.
- Deployed successfully at the Re Umberto station in Turin from May 2019 ([video](#)).

### Autonomous electric car project

*Italdesign*

PROTOTYPE VEHICLE EQUIPPED WITH CAMERAS, LIDARS, RADARS, GNSS, IMU AND ULTRASONIC SENSORS

C++, Python, ROS

- Designed the sensor set and software architecture of the vehicle. Developed and integrated the following functionalities:
  - Perception: 2D and 3D obstacle detection, semantic image segmentation, pedestrian, traffic sign and car detection.
  - Mapping and localization with camera, Lidar, IMU, odometry and GNSS.
  - Planning: trajectory following and decision-making.
  - Control: PID and Model Predictive Control.

### Pop.up Next

*Italdesign*

MODULAR FLYING TAXI IN COLLABORATION WITH AIRBUS AND AUDI

C++, ROS

- Amsterdam [Drone Week 2018](#): 1:4 scale model flying [demonstration](#). Developed the following:
  - Vision-based drone detection and pose estimation from car module.
  - Autonomous navigation for centering and latching with the drone module.

### Traffic sign classification

*SDCN*

CONVOLUTIONAL NEURAL NETWORKS (CNN)

*Tensorflow, Keras*

- Implement and train a neural network to classify traffic signs using the German Traffic Sign Recognition Benchmark (43 signs in total).
- Designed a CNN inspired by LeNet architecture, with L2 regularization, data augmentation, image preprocessing and dropout.
- Obtained 98.5% of validation accuracy with a fast convergence using only a CPU to train.

### Romeo project (with Softbank Robotics) and Comanoid project (with Airbus)

*INRIA*

PERCEPTION, NAVIGATION, SENSOR-BASED CONTROL AND HUMAN-ROBOT INTERACTION

C++, Python, ROS

- Delivered the following [demonstrations](#): object localization and grasping, dual arm manipulation, door handle detection and opening, camera-based and audio-based navigation, people following and obstacle avoidance.
- Demonstrations based on object detection, model-based tracking, template tracking, 3D point cloud segmentation, augmented reality, text detection on natural images, face detection and recognition, sound localization and speech recognition.
- Visual servoing in an optimization framework for the whole-body control of humanoid robots.

## Other interests

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### Pop/rock singer and music event organizer

Groups: Organised and led bands and musical events in France, Italy and UK

Member of Mika's choir: Concert at Roundhouse in Chalk Farm, 13 Dec 2012

*London, UK*

AIMS Summer School: Courses attended: Cabaret class, Vocal Technique, Musical class

*Eastbourne, UK*

1st Place: Singing competition "Solo per una voce". Jury headed by TOSCA. Prize: AIMS Summer School (2012)

*Genoa*