LENIN JHOAN CRUZ QUISHPE

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Personal website: https://portfolio-sitee.herokuapp.com/ **Via Palmanova – Milan, Italy**

EDUCATION

MSc Automation and Control Engineering

Politecnico di Milano – Italy, Milan **Expected: Feb 2022 – Mar 2024**

Relevant courses: Computer Aided Manufacturing; Statistical Learning for Automation; Dynamics of Mechanical Systems; Dynamics of Electrical Machines and Drives; Production Systems Control; Control of Industrial Robots. Systems for Industrial Automation; Internet of things, Automation of Energy Systems.

BEng (Hons) Mechatronic Engineering with Industrial Experience (WIE)

The University of Manchester – United Kingdom, Manchester **Sep 2017 – Jun 2021**

Graduation grade: First Class Honours

Bachelor Thesis: Supervised Learning algorithms for the classification of human gait patterns.

Relevant courses: Industrial and Mobile Robots; Mechatronic Analysis & Design; Embedded Systems; Power Electronics; Microcontroller Engineering; Control Systems; Sensors & Instrumentation; Energy and Transport.

Honours:
- Recipient of the 'STELLIFY Award 2021' for extra-curricular contribution to the School of Engineering
- Recipient of the 'SENESCYT 2015' scholarship of merit for outstanding performance in the Ecuadorian National Exam for higher education. Ranked in the top 0.01%.

International Foundation Year (Engineering)

INTO Manchester Centre – United Kingdom, Manchester **Sep 2016 – Jun 2017**

A-levels: Physics (A*), Further Maths (A*), Maths (A*)

WORK EXPERIENCE

Production Systems Control Lab assistant

Politecnico di Milano – Italy, Milan **Apr 2022 – Jun 2022**

- Worked under the supervision of a Professor at the Politecnico di Milano to develop the control system of a loading station of a production line. The project involved describing the system with an automaton model, PLC programming in **CODESYS,** and 3D modelling and simulation using **FlexSim**.

Engineering Intern (Placement year)

AVL Powertrain UK Ltd – United Kingdom, Coventry **Jul 2019 – Jun 2020**

- Research and Development for a self-driving vehicle (level 4).
  - Designed and implemented a **Simulink** Model for short-range object detection with Ultrasonic sensors.
  - Developed a tool for software testing and reporting automation with **MATLAB** and **MS Word VBA**.
  - Developed a GUI for data visualization with the PyQt5 library for **Python**.
  - Data analysis of AV sensors (GPS, Ultrasonic, RADAR, Mobileye, IMU, Polysync) with **MATLAB**.
  - SW component testing, reporting and documentation.

OTHER EXPERIENCE

Student Academic Representative

Department of Electrical and Electronic Engineering – United Kingdom, Manchester **Sep 2020 – Jun 2021**

- Collected student feedback and reported monthly to the department authorities to enhance the online learning experience during the covid-19 pandemic.

Students' Union Society Treasurer

The University of Manchester Ecuadorean Society – United Kingdom, Manchester **Aug 2020 – Jun 2021**

- Developed an annual budget to host seven events throughout the year of the pandemic covid-19.
- Left the charge with a positive balance of 120% with respect to my predecessor.

Academic Mentor

PASS Leader Program – United Kingdom, Manchester **Sep 2018 – Apr 2019**

- Mentored of a group of 20 first-year undergraduate students of Electrical and Electronic Engineering.
- Carried out weekly study sessions on topics of Circuit Analysis, C programming, Mathematics and Physics for Engineering, Electronic materials, and Microcontroller Engineering.

KEY PROJECTS

Control of a coupled MIMO non-linear system. (video)
Politecnico di Milano – Italy, Milan **Feb 2023 – Jun 2023**

Worked in the position control of the end-effector of a pantograph robot powered by two servo motors. The project included black-box system identification, state-space modelling, PD controller, Pole Placement with Luenberger observer and Linear Quadratic Regulator with Kalman observer (LQG).

Bachelors' Dissertation Project
University of Manchester – United Kingdom, Manchester **Oct 2020 – May 2021**

Implemented five **supervised machine learning** algorithms (KNN, Random Forest, AdaBoost, Gradient Boost and XGBoost) for **classification** of human gait patterns. The project used **Python** libraries (i.e., Pandas, NumPy, Skilearn and Scipy) and achieved a maximum of 81% accuracy.

Processing and Reporting Tool (blog)
AVL Powertrain UK Ltd – United Kingdom, Coventry **Jan 2020 – Mar 2020**

Developed a software testing and report **automation** tool using **MATLAB** and MS Word **VBA**. The tool analyses MATLAB data-logs against SW metrics in Excel and generate a test report in word and pdf format. For a data-log file of size 687 KB, it takes about seven minutes and generate a 115 pages report.

Main features: algorithm for report automation, raw hyperlinking, bookmarking and table of contents algorithm.

Autonomous Buggy Team project (video)
University of Manchester – United Kingdom, Manchester **Sep 2018 – Apr 2019**

Built a line follower robot buggy from scratch (hardware and software) in a team of four people. The robot navigates autonomously around a track using a **PID control algorithm** for position and speed with feedback from wheel encoders and reflective sensors. Control algorithms were developed in **C++** on a **STM32 microcontroller** board.

My contributions: Hardware design (**CAD**), Sensor characterization and data analysis, Lane keeping Algorithm (PID).

OTHER PROJECTS

Omnidirectional Robot Odometry **Apr 2022 – May 2022**

Odometry and Robot Kinematics computing from wheel encoders data using **C++** within the **ROS** framework.

Personal Website (website) **Jul 2020 – Aug 2020**

A showcase of my projects as a mechatronic engineering student. I used the **React** library for **JavaScript** to build the Front-end, and **NodeJS** with **ExpressJS** to build a Contact Page to receive queries to my personal email address.

GUI for data Visualization (video) **Jul 2020 – Aug 2020**

Interfaced **MATLAB** and **Python** via a UDP socket to simulate and visualise on the ground vehicle testing. A GUI was developed in Python and PyQT5 to plot vehicle data coming from MATLAB data-logs.

MBED Mini project (video) **Nov 2018 – Dec 2018**

Designed an alarm clock interface on top of a **STM32** board and an MBED application shield. The user can set date and time, set an alarm and a ring tone, and check the device on-time. **C++** language and the MBED library were used.

SKILLS SUMMARY

Programming and scripting: C, C++, C++/ROS C#, Python, MATLAB, Word VBA, JavaScript, R, Assembly.

Project Management tools: Gantt Project, Integrity PTC, Microsoft Planner, Git

Laboratory instruments: NI ELVIS II board, NI myDaq, Oscilloscope, Function generator, Multimeter

Microncontroller Units: STM32 Nucleo-64, Arduino-Uno.

Simulation Software: Simulink, LabVIEW, Gazebo Simulator, Multisim, FlexSim.

CAD Software: SOLIDWORKS, Altium CAD.

Internet of things: TinyOS, Node-RED, Wowki, Wireshark.

Languages: Spanish (native), English (fluent), Italian (intermediate), Portuguese (intermediate),

References available upon request.