Research Project:

Design and Implementation of an Integrated PLC and Virtual HMI Solution for an Industrial Process Automation.

Summary:

This project aims to modernise and automate a station belonging to the former Flexible Manufacturing Cell at IQS, through the design and implementation of an updated industrial automation and control system.

The main objective is to develop and program a Programmable Logic Controller (PLC) to manage and coordinate the operation of the sorting station, implementing the necessary control logic, operating sequences, and interaction with the station's sensors and actuators.

In addition, a virtual Human-Machine Interface (HMI) will be designed and implemented to enable operators to monitor, supervise, and control the station through an intuitive graphical environment. The interface will incorporate the essential functionalities for process visualisation, operating commands, system status monitoring, and fault indication.

Both the PLC and the virtual HMI will be developed using Siemens TIA Portal, ensuring their integration and communication within a unified automation environment.

The project will also involve testing and validation of the implemented solution to verify the correct execution of the sorting process, the reliability of the control sequences, and the proper interaction between the PLC, the HMI, and the station's physical components.

Reference:
[1] Programming a Siemens SIMATIC S7-1500 PLC using TIA Portal.

Position offered (2026-27): 1 Graduate or Master research project (6-9 months).

Contact:
Dr. Sauro J. Yagüe (sauro.yague@iqs.url.edu)