

OE & Training

ETAT Workshop

Spinning around Industry 4.0

Felipe Mateos, Reyes Poo, Antonio Robles

Automatic and System Engineering Area – University of Oviedo (SPAIN)

fmateos@uniovi.es, repoo@uniovi.es, arobles@uniovi.es

Workshop goal

The new paradigm of Industry 4.0 is creating the need for advanced training in many of the disciplines involved and new skills. University studies include new methods, materials and learning mechanisms to try to meet these demands. The enormous complexity and high cost of these education systems often results in the availability of equipment and tools that only partially cover these needs and in an uncoordinated way. For three years, a multidisciplinary group of teachers and students from the University of Oviedo has been designing, building and operating a pilot plant for the manufacture of "hand spinners". This facility provides a practical and realistic insight into the theoretical/practical knowledge of many of the enabling technologies of Industry 4.0.

This proposed workshop is focused on presenting the main aspects of the development and results obtained so far with this facility. Experiences and some practical demonstrations will be provided.

To whom is the workshop addressed

Basic knowledge of Industry 4.0 and its enabling technologies, as well as automation and industrial communication systems.

The Methodology

The spinner manufacturing plant, which is presented in this workshop as a teaching and research resource, has the necessary characteristics to serve as a demonstrator of integrated applications associated with industrial digitalization. It incorporates enabling disciplines and technologies around Industry 4.0 ("Spinning Around Industry 4.0"). It is a multidisciplinary environment that allows experimentation in these topics in a realistic way and with a high level of motivation.

Participants will find an installation conceived from scratch in every domain (mechanical, electrical, control and communications) and a bunch of advanced applications in different areas. The plant has been created and developed by a group of professors from different departments and with the help of undergraduate and master students. It is still posing a challenge to fully exploit its possibilities. Up to now, this installation has been the basis of numerous projects in different subjects, as well as bachelor and master thesis. It has also to be mentioned the collaboration of some companies and institutions such as Alcoa, ABB, Phoenix Contact, SMC, IUTA ...

This workshop intends to present the keys of design, the aspects of its implementation and the presentation of some works. Reference will also be made to the studies where it is applied, the teaching methodologies on said platform and future ideas for the feature's improvement. All this from a very

expatWS'21 Thematic Workshop Abstract

practical point of view and with some videos and online demonstrations of the infrastructure. Experiences on automation and control systems architectures, advanced IEC 61131-3 programming, industrial communications, HMI systems, vertical and horizontal integration, functional safety, artificial vision, robotics, traceability, connection to the cloud and analysis of data, among others will be analysed. Participants will be able to find and discuss ideas about teaching these technologies from similar facilities, analysing their advantages and disadvantages, the problems associated with the maintainability of resources and the complexity of integrating applications related to Industry 4.0.

The Workshop duration

Initially, if this workshop proposal is approved, please reserve 2 hours.