



Hands-On Training for Human-Centric Digital Twin in a Learning Factory Environment

Marina Crnjac Žižić¹ , Amanda Aljinović Meštrović¹ , Boris Crnokić² ,
and Ivan Peko³ 

¹ Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture,
University of Split, Split, Croatia

{mcrnjac, amaljino}@fesb.hr

² Faculty of Mechanical Engineering, Computing and Electrical Engineering,
University of Mostar, Mostar, Bosnia and Herzegovina

boris.crnokic@sum.ba

³ Faculty of Science, University of Split, Split, Croatia

ivan.peko@fesb.hr

Abstract. The rapid development of market demand and the pursuit of sustainable industrial practices require a change in production and business models. This transformation is being driven by new technologies such as cyber-physical systems (CPS), the Internet of Things (IoT) and cloud computing. Human-centric digital twins (HCDTs) play a crucial role in this transformation as they put people at the heart of digitalization. By integrating human data, ergonomics and real-time interactions, HCDTs not only optimize efficiency, but also improve workplace safety, employee well-being and adaptability. This approach supports the development of flexible, customized and resilient production systems that align with the goals of Industry 4.0 and sustainability. The learning factory environment at the University of Split, Faculty of Electrical Engineering, Mechanical Engineering, and Naval Architecture (FESB), provides an applied education platform that combines academic knowledge with industrial requirements. This program offers students, and industry partners the opportunity to engage in real-world projects focused on the implementation of HCDT. Participants gain hands-on experience using sensors and CPS to collect and analyze data and use modeling and simulation tools to create digital twins. By working in a collaborative environment, students develop critical problem-solving skills while industry partners explore innovative solutions to optimize production processes. This hands-on training provides the participants with the knowledge and technical skills they need to integrate new technologies into engineering and industrial applications, driving innovation and competitiveness in the evolving manufacturing landscape.

Keywords: human-centric digital twins · engineering education innovation · development of hands-on training programs · learning factory · process management · ExCurS project

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