International Conference on Optimization, Learning Algorithms and Applications

OL2A'2021

BOOK OF ABSTRACTS

Instituto Politécnico de Bragança
July 19-21, 2021

Editors

Ana Isabel Pereira
Instituto Politécnico de Bragança

Florbela P. Fernandes
Instituto Politécnico de Bragança

João Paulo Coelho
Instituto Politécnico de Bragança

João Paulo Teixeira
Instituto Politécnico de Bragança

Maria F. Pacheco
Instituto Politécnico de Bragança

Paulo Alves
Instituto Politécnico de Bragança

Rui Pedro Lopes
Instituto Politécnico de Bragança

Instituto Politécnico de Bragança
Campus de Santa Apolónia
5300-253 Bragança - Portugal
ISBN: 978-972-745-291-0

Book cover: *Divaga Design*

Welcome

Welcome to OL2A 2021 - International Conference on Optimization, Learning Algorithms and Applications.

OL2A offers a forum for the research community on optimization and learning to get together and share the latest developments and techniques as well as develop new paths and collaborations.

OL2A provides a wide scope of presentations, covering many areas of optimization and learning and state of the art applications to multi-objective optimization, optimization for machine learning, machine learning for optimization, optimization and learning under uncertainty and 4th industrial revolution.

It is with great pleasure that the Organizing Committee welcomes you all to OL2A 2021!

The OL2A'2021 organization committee,

Ana Isabel Pereira, Florbela Fernandes, João Paulo Coelho, João Paulo Teixeira, Maria Pacheco, Paulo Alves and Rui Lopes

Machine Vision to Empower an Intelligent Personal Assistant for Assembly Tasks

Matheus Talacio, Gustavo Funchal, Victória Melo, Luis Piardi, Marcos Vallim and Paulo Leitão

Research Center in Digitalization and Intelligent Robotics (CeDRI), Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal and Universidade Tecnológica Federal do Paraná (UTFPR), Avenida 7 de Setembro 3165, Curitiba 80230-901, Paraná, Brazil

In the context of the fourth industrial revolution, the integration of human operators in emergent cyber-physical systems assumes a crucial relevance. In this context, humans and machines can not be considered in an isolated manner but instead regarded as a collaborative and symbiotic team. Methodologies based on the use of intelligent assistants that guide human operators during the execution of their operations, taking advantage of user friendly interfaces, artificial intelligence (AI) and virtual reality (VR) technologies, become an interesting approach to industrial systems. This is particularly helpful in the execution of customised and/or complex assembly and maintenance operations. This paper presents the development of an intelligent personal assistant that empowers operators to perform faster and more cost-effectively their assembly operations. The developed approach considers ICT technologies, and particularly machine vision and image processing, to guide operators during the execution of their tasks, and particularly to verify the correctness of performed operations, contributing to increase productivity and efficiency, mainly in the assembly of complex products.

Occupational Behaviour Study in the Retail Sector

Inês P. Sena, Florbela P. Fernandes, Maria F. Pacheco, Abel A. C. Pires, Jaime P. Maia, and Ana I. Pereira

Research Centre in Digitalization and Intelligent Robotics (CeDRI), Instituto Politécnico de Bragança, 5300-252 Bragança, Portugal and Direção de Segurança no Trabalho da SONAE MC - Serviços Partilhados, SA

The health, safety, and well-being of employees, service providers, and customers are important priorities for retail companies. Based on this principle, an intelligent system that contributes to the reduction of accidents at work will be developed, monitoring risk control, preventing work-related illnesses, promoting a culture of zero accidents, and seeking to ensure the health of employees, customers, and stakeholders. In order to achieve such goals, it is necessary to determine the local and global variables (internal and external) that feed the system. This study comprises the first strategy applied to collect the local variables involved in the problem. To obtain this, a data analysis study in a retail store was performed. Data analysis procedures were performed namely clustering analysis with algorithm k-means, correlation procedures, like Pearson coefficient and matrix of correlation, and relationship analysis with parallel coordinate graphs. From the preliminary results, it is possible to indicate a set of local variables that have influence in the occupational behavior and accidents at work.
