International Conference on Optimization, Learning Algorithms and Applications

OL2A'2021

BOOK OF ABSTRACTS

Instituto Politécnico de Bragança
July 19-21, 2021

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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

Artificial Intelligence architecture based on planar LiDAR scan data to detect energy pylon structures in a UAV autonomous detailed inspection process

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The technological advances in Unmanned Aerial Vehicles (UAV) related to energy power structure inspection are gaining visibility in the past decade, due to the advantages of this technique compared with traditional inspection methods. In the particular case of power pylon structure and components, autonomous UAV inspection architectures are able to increase the efficacy and security of these tasks. This kind of application presents technical challenges that must be faced to build real-world solutions, especially the precise positioning and path following for the UAV during a mission. This paper aims to evaluate a novel architecture applied to a power line pylon inspection process, based on the machine learning techniques to process and identify the signal obtained from a UAV-embedded planar Light Detection and Ranging - LiDAR sensor. A simulated environment built on the GAZEBO software presents a first evaluation of the architecture. The results show an positive detection accuracy level superior to 97% using the vertical scan data and 70% using the horizontal scan data. This accuracy level indicates that the proposed architecture is proper for the development of positioning algorithms based on the LiDAR scan data of a power pylon.

Overview of Robotic Based System for Rehabilitation and Healthcare

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As in many other fields, robots are increasingly being used in the healthcare sector, particularly for hospital logistics support, surgery and rehabilitation. Rehabilitation is a concern for millions of people around the world, and because of this, there has been a constant progress over the last decade in the rehabilitation robotics field, with the use of new technologies aimed at overcoming the different challenges faced in this field. In this sense, this paper reviews the main applications developed in the last ten years of rehabilitation robotics, as well as the different challenges that still need to be addressed in order to achieve the design of a prototype that is easy to use, small, safe, less costly and brings real added value to this field. Much of the efforts of the researchers in this topics is focused on providing as many DOF and ROM as possible, and also on the designing of new robots control algorithms.
