Bizkaia talent

Company Description

Mondragon Unibertsitatea es una Universidad práctica, innovadora y comprometida, centrada en el desarrollo de las personas, orientada a las necesidades de la empresa y la sociedad, pensada para hacer frente a los desafíos del mundo real y donde el conocimiento y su aplicación no tienen fronteras.

Information

- Deadline: 2022-10-31
- Category: Academia
- Province: Gipuzkoa
- Country: Basque Country
- City: Arrasate - Mondragón

Company

Mondragon Unibertsitatea

Main functions, requisites & benefits

Main functions

The revolution in robotics and autonomous systems (RAS) is unstoppable. The advance of autonomous system applications, such as autonomous transport [1, 2] and autonomous inspections [3], generate multiple benefits for the industry and society, including the improved driving security in autonomous transport, and improved reliability of critical and remote infrastructure through specialized robots and drones. However, the reliability assurance of RAS is a complex challenge, as it requires incorporating advanced intelligence that should evolve according to run-time operation [4]. The challenging yet exciting, operation context of RAS, hampers the reliability assurance of RAS, which decelerates the acceptance and everyday use of RAS. Different technological solutions have emerged to improve the design and reliability of RAS [5]. Most of the technological configurations include a combination of mechanical and electrical components, along with onboard software intelligence to adopt decisions without direct human intervention. In this context, using the ever-increasing prognostics and health management solutions, it is possible to develop a prognostics modelling approach for RAS health monitoring through the use of reliability, machine learning, uncertainty modelling and optimization methods [6]. The project's objective is to develop novel prognostics methods for RAS which can accurately inform about the model's confidence in the decisions in real-time, and always, provide a worst-case estimate on its predictions by using a proper modelling and update of the different sources of uncertainty. In particular, the work will focus on the integration of uncertainties to make prognostics predictions robust, using concepts such as adversarial learning, combined with statistical learning and artificial intelligence methods. The models developed in this project will be validated with the data collected from Alerion Technologies company (https://aleriontec.com/), focused on autonomous remote inspections for renewable energy. The project will be developed in Mondragon Unibertsitatea within the Electronics and Computer Science Department, in collaboration between the Artificial Intelligence and Signal Processing and Communications groups. Throughout the thesis, the student will engage continuously with industry and stays at different universities and/or research centers will be pursued.

Requisites

M. Sc. degree in telecommunications, electronics, computer science, embedded systems or a related area. Programming skills: Matlab, Python, R, or C++ (samples from prior projects or a GitHub repository are preferred) Statistics/mathematics, data science/AI/ML Knowledge/experience with autonomous systems is a plus. Knowledge/experience with reliability and/or diagnostics/health management methods is a plus. Experience with artificial intelligence / optimization methods is a plus.