ESR (PREDOTORAL RESEARCHER) IN DEEP LEARNING ALGORITHMS IN INDUSTRY 4.0 QUALITY

Company Description

IK4-TEKNIKER is a Technology Centre specialised in Advanced Manufacturing, Surface Engineering, Product Engineering and ICTs technologies, promoting its transfer to companies.

Information

📅 Deadline: 2019-04-30
🗂 Category: Business
🚩 Province: Gipuzkoa

🌐 Country: Basque Country
🏛 City: Eibar

Company

TEKNIKER

Main functions, requisites & benefits

Main functions

Introduction The DIGIMAN 4.0 (DIGItal MANufacturing Technologies for Zero-defect Industry 4.0 Production) Project aims, within the framework of the MSCA-ITN-2018 initiative, at the provision of world excellent research training to 15 ESRs (Early Stage Researchers) in the field of digital manufacturing technologies for Industry 4.0.   This research training will focus on three main aspects: 1) Innovative technological solutions for high quality, high throughput and high precision production; 2) Cutting edge multi-disciplinary training in different domains and 3) Validation of different digital manufacturing technologies by integration into process chains for the production of advanced components in several sectors.   Core Training and research   The Job offered by IK4-TEKNIKER is framed in the competitive market demands of products with zero defects in the ferromagnetic parts production. Industrial companies try to reduce those defects through the complete manufacturing process, but nevertheless customers' requirements sometimes demand the introduction of 100% inspection of the final product.   In the case of ferromagnetic parts production, magnetic particle inspection allows detecting some surface and near-surface defects which are not otherwise visible to the eye. The identification of these defects is done by qualified operators by visual inspection of the parts once the particles are applied.   The objective of the ESR will be to investigate and develop a method for automatic defect identification in ferromagnetic parts based on magnetic particles technique. The proposed approach is to combine basic image analysis with state-of-the-art deep learning techniques in order to improve the detection accuracy.   The proposed project will be focused on carrying out research in the following topics, to obtain surface defect detection algorithms that will outperform the actual solutions: Creation of datasets of typical errors present in industry (scratches over metallic parts, breakages, etc). Use of machine vision algorithms to identify basic defects Benchmarking of network architectures especially suitable for industrial problems. Use of transfer learning techniques to adapt existing CNN architectures to industrial applications. Performance testing and real time implementation tasks. Planned secondments: The development of the training process includes a period of time of to be spent in the company ERREKA Fastening (Spain). E.F. is a company devoted to providing high added value solutions for bolted joints used in critical applications in several sectors, such as oil, chemical and wind-power. They want to assess the quality of 100% of their production of forged bolts and studs and will facilitate the use of a robotized cell including bin-picking to feed a Magnaflux station, and samples to develop and test the algorithms.   Doctoral Training   The selected ESR will enroll in a Doctoral programme leading to the award of a doctoral degree by the University of Zaragoza (Spain).

Requisites

Required subject specific skills and expertise: Master degree in related technical field (e.g., computer science, electrical or mechanical engineering, physics, mathematics). It is desirable some programming skills.   Eligibility Criteria with respect to Mobility   At the time of recruitment, the Early Stage Researcher (ESR) must not have resided or carried out his/her main activity (work, studies, etc.) in Spain for more than 12 months in the 3 years immediately prior to his/her recruitment under the project (July 2019).   Equal opportunities and non-discrimination   IK4-TEKNIKER supports equal opportunities in its recruiting processes no matter the gender, age, ethnic