EPSRC Industrial CASE PhD Studentship on Image Analysis

Title: PhD studentship: Image Analysis for Complex Data in Non Destructive Testing
Where: Department of Electronic and Computer Engineering, Brunel University London, London, UK
Reference: **PHD13**

Qualification type: PhD
Location: National Structural Integrity Research Centre (NSIRC) Cambridge, UK
Funding for: UK and EU students
Funding amount: Fees plus £20000 per year
Hours: Full Time

Placed on: 26 October 2015
Closes: **30 November 2015**

Primary supervisors: Dr Hongying Meng (Brunel University London) and Dr John Rudlin (TWI)

The project:
This project follows on from a major European collaborative project focussed on whole life rail axle assessment and Improvement. It is based at the NSIRC in TWI, Cambridge.

Non-Destructive Testing (NDT) techniques are a wide group of analysis techniques used in science and industry to evaluate the properties of a material, component or system without causing damage. TWI has been at the forefront of the research, development and application of many advanced and conventional NDT technologies for more than 40 years (http://www.twi-global.com/capabilities/integrity-management/non-destructive-testing/).

This PhD project will develop image analysis techniques for rail axle inspection. Rail axles suffer from high cycle fatigue during operation and also corrosion due to the environment, which modifies the fatigue properties. In order to identify when the cracking process is beginning a microscope image of the axle surface has been used.

The project will require the student to take images (existing) from real axles which contain a mixture of corrosion and cracks and try to develop an image analysis technique to automate the identification of cracks within the corrosion. The student can also develop image analysis in other areas of NTD (e.g. digital image correlation)

What you will be doing:
In order to develop an advanced image analysis system, there are several difficult challenge yet to be addressed, including:
1. In order to use image analysis for rail axle inspection, the main issue of background "noise" must be solved. This can be achieved through image processing methods (e.g. edge detection, image enhancement, etc.) and image pre-conditioning/filtering.
2. In order to identify of cracks within the corrosion on the axle surface, the area and its property need to be detected and identified. It can be solved using advanced image analysis and pattern recognition methods (e.g. segmentation, deep learning, etc.).
3. The information gathered in the project will be used to develop and propose design guidance for automatically rail axle inspection.

What you will get from this project:
You will be based at the NSIRC in TWI, Cambridge which currently has over 40 PhD students currently and many more about to join. The NSIRC is a state-of-the-art postgraduate engineering facility offering PhD and MSc programmes in structural integrity. The project will be supervised by Dr Hongying Meng from Brunel University London. You will be working in a collaborative and stimulating environment, strengthened by the collaboration between academic and industrial partners. A primary benefit of the working environment at the NSIRC is the exceptional industrial links with many of the projects funded by industrial partners. This provides you with opportunities to gain valuable experience and contacts by working with technical industry experts.

- Further information on Electronic and Computer Engineering at Brunel:
  http://www.brunel.ac.uk/cedps/electronic-computer-engineering
- Further information on the NSIRC: http://www.nsirc.co.uk/

Candidate requirements:
We're looking for exceptional students, with at least a 2:1 Honours degree, from engineering and related subjects.

Funding:
Enhanced EPSRC studentships covering fees and living costs are available to UK/EU students.

How to apply:

Applications should be made with a full CV and a covering letter which includes a personal statement, interest in the research and any supporting information directly to the project supervisors. Only shortlisted candidates will be contacted for interview.

To send applications and for enquiries, please contact:

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