A PhD Scholarship in SPARC Hub

The Opportunity

The ARC Smart Pavements Hub (SPARC) invites applications for a PhD-position in enhancing the use of Ground Penetration Radar (GPR) techniques for evaluation of road pavement layer thickness and condition through lab/field testing for pavement remaining life estimation.

Smart Pavements Australia Research Collaboration (SPARC)

SPARC Hub, which is a partnership between Monash and 7 other Australian Universities and 20+ Industry Partners, is embarking on a range of exciting research projects, offering an unprecedented opportunity for recent graduates to establish their postgraduate career in various engineering fields. The Hub offers a coherent PhD and Masters by research program for high achieving passionate students and is committed to create an intellectually exhilarating and vibrant environment towards excellence.

Project Background

Over the past few decades, several non-destructive testing & evaluation (NDT & E) techniques have been developed to enable more efficient assessments of road pavements and materials, featuring high-speed data acquisition, cost-effectiveness, and the capability to be performed in-situ over longer distances. In particular, the ground penetrating radar (GPR) technique based on the transmission and reception of short electromagnetic (EM) impulses is nowadays established as one of the most effective and powerful tools, due to its high flexibility of usage and reliability of results. Studies based on air- or ground-coupled GPR systems mainly focus on the measurement and analysis of material dielectric constant values for pavement thickness estimation. However, this approach may only be valid for newly built flexible pavements with the assumption that the dielectric constant within the pavement is uniform. As a result, it cannot provide reliable information for the whole layer and the errors in thickness estimation may increase when the asphalt mixture ages or when the asphalt layer is made of multiple lifts.

This project will seek to enhance the use of current GPR technique to provide more accurate pavement layer thickness measurements and pavement condition, based on which the pavement remaining life can be estimated. The project will also investigate the possibility of integrating GPR technology with other testing facilities, such as lightweight deflectometer (LWD), falling weight deflectometer (FWD), infrared thermography (IRT) and global positioning system (GPS) in order to provide more comprehensive information of pavement condition.

Qualification Requirements

1. Applicants must have completed at least a bachelor’s degree in one of the following areas: Civil Engineering, Geophysics, Applied Physics, and Materials Engineering. Both Australian and international applicants will be considered.
2. The applicant must have a strong academic record, which, for example, amounts to a grade point average (GPA) of 3.7 (out of 4.0) or higher, or equivalent to H1 or First Class Honours Degree.
3. The applicant should have some knowledge/background and interest in the following areas: GPR techniques, numerical modelling of electromagnetic waves, Pavement condition assessment.
4. The applicant must have an interest in undertaking field work.
5. The following criteria will be considered during the assessment:
   (i) Candidate’s academic performance in the bachelor’s degree (or Master’s degree),
   (ii) Quality of the degree completed (preference will be given to Master’s degree),
   (iii) Completion time of the degree,
(iv) Knowledge in the relevant research field including any publications in reputable journals,
(v) English language proficiency (refer to the following link for more information: English Language Requirements), and
(vi) Online interviews and references.

Faculty / Portfolio: Department of Civil Engineering, Faculty of Engineering

Location: Clayton campus, Monash University

Remuneration: Stipend can range from $27,872 to 32,300 p.a. full-time rate (pro-rata) and tax-free

Closing date for expression of interest (EOI): 21st of June, 2019

To Apply:
- Submit an Expression of Interest
- A curriculum vitae, including a list of published works
- A full statement of academic record, supported by scanned copies of relevant certified documentation
- Contact details of two academic referees
- Evidence of English-language proficiency (international applicants only)

Enquiries and EOIs shall be sent to:

The Lead Chief Investigator, Dr Ye Lu, Dept. of Civil Eng., Monash University, Clayton Campus (Australia)

Email: Ye.Lu@monash.edu

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