HDR Project with Transdev under the

‘Safe Sustainable Accessible Railways - Graduate Research Industry Partnerships’ (S^{2}ARail GRIP)

TOPIC: Dynamic scheduling of public transport drivers and services to respond to disruptions

BRIEF PROJECT DESCRIPTION

Traditional approaches to scheduling are focussed on providing best solutions in a deterministic setting where all travel times are known. This research would develop new models and computational algorithms to address the inherent variability and uncertainty of travel times in two ways. Firstly, by considering the uncertainty during schedule construction to build in flexibility to enable recovery, and secondly by developing algorithmic tools to rapidly reschedule in the presence of changes to travel time in a dynamic environment.

INDUSTRY PARTNER

The project will be conducted in collaboration with the industry partner TRANSDEV AUSTRALASIA. The project will require regular collaborative work with the teams at Transdev who are based in Melbourne and Syndey.

SCHOLARSHIP & PROFESSIONAL DEVELOPMENT

Scholarship: $40,000 p.a. 3.5 years full-time rate (pro-rata). The Faculty of Science will provide Tuition fee scholarship and overseas student health cover (OSHC) for international students.

Professional development: As part of the Monash Doctoral Program, S^{2}ARail GRIP students will complete a minimum of 120 hours of professional development training.

SUPERVISORS

Academic supervisors:

- Prof. Andreas Ernst, School of Mathematics, Monash Data Futures Institute, Faculty of Science

Industry supervisor:

- Thibaud Robineau, A/Head of Network Solutions, TRANSDEV AUSTRALASIA
- Dr. Elias Kassa, Monash Institute of Railway Technology, Faculty of Engineering

ELIGIBILITY & APPLICATION INFORMATION

Applicants will be considered provided they fulfil the criteria for PhD admission at Monash University and demonstrate excellent research capability. Details of the relevant requirements are available at https://www.monash.edu/graduate-research/future-students/apply

Candidates will also be required to meet Monash University's minimum English language proficiency requirements for entry into a higher degree by research program.

Applications who meet the following criteria will be prioritised:

- Have authored peer-reviewed research publications
- Possess excellent written and verbal English skills

Note: Applicants who already hold a PhD degree will not be considered.

Specific Eligibility Requirements:

- An H1 (first class) or H1 equivalent honours degree and/or a Master's Degree in a relevant technical field such as mathematics, computer science or engineering.
- Exposure to stochastic modelling and/or machine learning.
- Strong background in (discrete) optimisation, ideally both from an operations research and computer science perspective.
- Ability to implement high-performance computational algorithms.
- Evidence of data modelling and analysis, and interpretation skills.
- Excellent written and verbal communication skills.
- Ability to work independently as well as in a team.
- Ability to plan, organise, manage multiple tasks and meet deadlines.

The successful scholarship holder must be enrolled full-time and must be on-campus. Shortlisted candidates will be interviewed, over Zoom if necessary. The interviews will be conducted in English.

To Apply: Submit an online EXPRESSION OF INTEREST

EOIs should comprise:

- A cover letter that includes a brief statement of the applicant's suitability
- 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)

Closing Date: Applications will close once suitable candidate has been identified

The successful candidate must be able to enrol in the degree by no later than March 31, 2024

FACULTIES INVOLVED

Science and Engineering

CONTACT DETAILS & ADDITIONAL INFORMATION

- Prof. Andreas Ernst. Email: Andreas.Ernst@monash.edu
- Faculty Graduate Research Office. Email: Sci-gradresearch@monash.edu
- S^2ARail GRIP. Email: S2ARail-GRIP@monash.edu