

A wide-angle photograph of a modern university campus. In the foreground, a paved plaza with a red brick pattern leads to a set of wide, light-colored concrete steps. Several students are sitting on the steps, some looking at their phones, others talking. To the left, a large, leafy green tree stands next to a brick building. In the background, a large, modern building with a white facade and a pattern of circular windows is visible. The sky is clear and blue.

Position Description

Position Title: Master by Research / PhD Research Student

Position Number:

Classification: Swinburne-Automotive Engineering
Graduate Program (AEGP)

Faculty: Faculty of Science, Engineering and Technology
(FSET)

Postgraduates (Masters by Research / PhDs) under Swinburne- Automotive Engineering Graduate Program (AEGP) funded by Australia's Department of Industry Innovation and Science

Project Description

In a vehicle collision, vehicle structures are expected to deform and dissipate impact energy to protect driver and other more important vehicle components. Meanwhile, in design a vehicle, its environmental performance is of the same importance as its technical performance. A light vehicle is more environmentally friendly because it consumes less fuel and emits less greenhouse gas. Recently developed manufacturing processes such as Additive Manufacturing (AM) are efficient techniques to produce more delicate structures with desired geometries. Moreover, AM can easily modify the geometrical parameters to obtain an optimal structure that possesses desirable mechanical properties. This proposed research project aims to develop light vehicle structural components which will be fabricated by AM and have high capacity of energy absorption. It is expected to increase the safety and reduce the weight and in the newly designed light commercial vehicles.

In this project, students will fabricate lightweight structures by using the state-of-the-art additive manufacturing techniques such as Selective Laser Melting (SLM), Fuse Deposition Modelling (FDM) and Multi Jet Fusion (MJF). Experimental tests, finite element simulation and/or theoretical analysis will be subsequently conducted to evaluate the mechanical performance of the printed materials and structures using the comprehensive facilities at Swinburne.

The project uniquely combines engineering design with materials, modelling and manufacturing skills, which will qualify the candidate for an excellent career in automotive R&D industry, and/or academia.

There is **TWO** full Postgraduate Scholarships (1 x Masters by Research & 1 x PhD) available. There will be opportunities to gain experience as research assistant and sessional tutoring work during the postgraduate journey.

Key words: Light-weight; Additive manufacturing; Mechanical property; Impact.

The scholarship funding is for **2 years (for Master by Research)** and/or **3 years but a 3 month extension may be possible upon application (for PhD)**. The successful applicant will be invited to submit application if he or she satisfies the general requirements of entry into a PhD program at Swinburne University of Technology, please see (<http://www.swinburne.edu.au/research/research-degrees/application-process/submit-application/>).

The Swinburne-AEGP scholarship offered will be consistent with the SUPRA at the University, with the 2019 SUPRA stipend rate of \$27,596 per annum with the following make conditions:

- i. Annual indexation.
- ii. A potential 3 months scholarship extension for PhD
- iii. An additional \$3500 for consumables and/or a conference (for PhD)
- iv. A thesis allowance (maximum \$840 for a PhD) and \$3500
- v. Tuition fee waiver up to four years for PhD

Location

This position is currently located at the Hawthorn campus. However, the incumbent may be required to undertake duties at any of the University's campuses. Thus, the incumbent must be willing to travel and work at a range of locations.

Key Responsibility Areas

Research	<ul style="list-style-type: none"> • Fabricate lightweight structures by using the state-of-the-art additive manufacturing techniques • Conduct experimental tests, finite element simulation and/or theoretical analysis to evaluate the mechanical performance of printed structures
Collaboration and Communication	<ul style="list-style-type: none"> • Work in close contact with the academic supervisory team and the industry partner to ensure clear communication of goals and timely delivery of intermediate results at given milestones.
Dissemination	<ul style="list-style-type: none"> • Publication of research outcomes in high-quality research outlets, such as high-ranked journals, book chapters and conference proceedings.
Swinburne Behaviours	<p>Commitment to the Swinburne Behaviours of:</p> <ul style="list-style-type: none"> • Communicate – Say it – have the conversation, respect each others’ differences, give meaningful feedback and share honestly and openly • Listen and Learn – Hear it, learn from it – learn from one another, actively listen to each other, resolve conflict and be innovative • Collaborate – Share it – work constructively together with a common purpose to achieve the university’s goals • Trust – Trust it – be open to and with others, act with fairness and respect, inspire positive expectations and communicate effectively • Act – Do it – have a strong sense of immediacy, take practical action and see it through
Other	<ul style="list-style-type: none"> • Undertake Division-wide and/or university-wide responsibilities as required.

Key Selection Criteria

Candidates are required to respond to each of the selection criteria.		Essential / preferable
Qualifications	• Bachelor (Honours) or Master degree (or equivalent) in Manufacturing or Automotive or Mechanical or Civil Engineering or Material Science or Mechanics, or a similar discipline	Essential
Experience	• Experience in modelling (CAD) and computer simulation (FEA)	Essential
	• Experience in material characterisation and experimental testings	Essential
Knowledge	• Knowledge in additive manufacturing	Preferable
Attributes	• Passionate and have interest in pursuing Masters by Research or PhD degree.	Essential
	• Experience in research project(s)	Essential
	• A team player who has good interpersonal skills and can collaborate well with others	Essential
	• Experience in publishing in good quality international journals	Preferable
Other	International applicants must provide evidence of one of the following: ◦ IELTS overall band of 6.5 (Academic Module) with no individual band below 6.0 or a TOEFL iBT (internet-based) minimum score of 79 (with a reading band no less than 18 and writing band no less than 20); or Pearson (PTE) 58 (no communicative skills less than 50) no longer than 24 months before submitting your application); ◦ successful completion of a total of 24 months of formal study where the language of instruction and assessment was English at an approved university no longer than 60 months before submitting your application.	Essential

Further information and how to apply

Please submit expression of interest (EOI) for this PhD scholarship position to **Prof. Dong Ruan** (druan@swin.edu.au) by using email subject "EOI-Swin-AEGP Scholarship". Please include a copy of your CV, academic degrees, academic transcripts, English test results (IELTS or TOEFL or equivalent) and copies of journal publications (if applicable).

The deadline for the EOI is **10 August 2019**.

Relevant weblinks:

Swinburne: <https://www.swinburne.edu.au/>

Design, Manufacturing and Mechanics Research Group: <http://www.swinburne.edu.au/science-engineering-technology/research/design-manufacturing-mechanics/>