



## Graduate Research Assistant

<b>School/Unit</b>	School Of Engineering
<b>Sub-Unit</b>	Civil Engineering Discipline
<b>Level/Classification</b>	Level A
<b>Employment Type</b>	Full Time (1.0)
<b>Work location</b>	Sunway Campus, Malaysia
<b>Date document created or updated</b>	9 January 2018

### Organisational context

Established in 1998, Monash University Malaysia is one of Malaysia's most respected universities. We are Monash University's global foot print in the Asian region, carrying with us the distinction of being the Malaysian constituent of a premier research intensive Australian university ranked among the top 100 universities in the world, and a member of Australia's prestigious Group of Eight (Go8). From humble beginnings, Monash Malaysia has grown in stature, and is now recognised as a leader in the international higher education sector in Malaysia.

As a self-accrediting University, we attract students not just from Malaysia, but from all over the world. Approximately 8,000 students representing more than 70 nationalities are currently enrolled at Monash Malaysia, and enjoy a quality academic experience.

Since our inception, Monash Malaysia has built a reputation for quality, credibility and integrity, and is held in high esteem by our students, alumni, industry and government. We encourage critical thinking to help discover new ideas, reveal new perspectives and devise solutions. We maintain a long and proud tradition of excellence in education, combined with liberal values of enquiry, providing a fertile environment for bright young minds to flourish, and life-long opportunities for those wishing to enhance their education and career.

For further information see: [www.monash.edu.my](http://www.monash.edu.my).

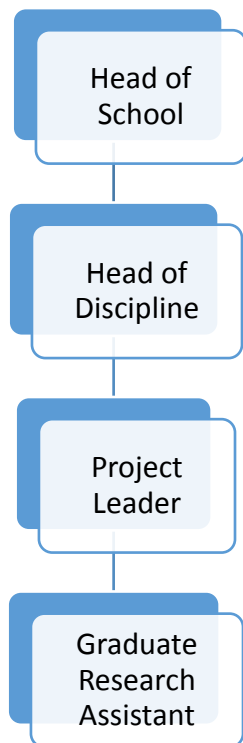
The School of Engineering continues to grow rapidly, particularly in the delivery of undergraduate programs, and through the expansion of its facilities and infrastructure. In addressing global engineering challenges of the 21st century, the expansion of research activities in our Malaysian campus is of high priority for the University, reflected by the significant increase of school collaborative partnership with the industry sector, and through the offering of the Higher Degrees by Research, the Master of Engineering Science (Research) and the Doctor of Philosophy (PhD). The School currently has close to 1,500 undergraduate students, consisting of approximately 70 academic staff, and 42 professional and technical support staff.

The School offers the 4-year Bachelor degree in 6 disciplines: Chemical Engineering, Civil Engineering, Electrical and Computer Systems Engineering, Mechanical Engineering, Mechatronics Engineering and Software Engineering. These are the 6 core disciplines of Engineering, driven by the strong and growing demand for capable graduates in Malaysia, the Asian region and beyond.

In line with the School Development Plan and to meet the thriving market demand, the school has recently started to offer the Master of Advanced Engineering (Energy and Sustainability), a 1-year Master by coursework program.

For further information: [www.eng.monash.edu.my](http://www.eng.monash.edu.my)

The reporting line of a Graduate Research Assistant (GRA) in the School of Engineering is as follows:



## Position purpose

'Renewable energy' has become an increasingly important aspect of city planning. It's efficient use is the key to enhancing national energy security and promoting the sustainable development of society. Although non-renewable fossil fuels supply 80% of current energy demands, this type of energy is exhaustible. The increasing energy demand, particularly from renewable sources, necessitates the development of innovative new electricity generation methods. As a renewable energy source, solar energy is virtually inexhaustible and provides an attractive alternative to traditional fossil fuel due to its environmentally sustainable benefits. The photo-thermal conversion and the photo-electricity conversion of solar energy have been widely used in living, industrial and agricultural production.

The School of Engineering is commencing an exciting new project funded by the Monash University Malaysia Sustainable Community Grant Scheme to develop a paver incorporated with solar panels, thereby allowing solar cells to generate electricity for Sunway City and be transmitted via network cables. An opportunity exists for a highly motivated person with sound technical and analytical skills to be appointed as a research assistant for a period of 24 months with immediate commencement.

This project adopts the concept of solar pavement technology used in France in which pavers are coated in a polycrystalline silicon film that provides protection against traffic loads. Some of the key challenges of developing a workable solar paver solution include cost – for example photovoltaic glass is much costlier than asphalt; and irradiance optimisation - rooftop panels being better placed than pavements to receive the best possible sunlight. Hence, this research also includes a system feasibility and design optimisation and not just product development.

This project focuses on electricity generation to power various applications, such as street lights and public spaces. Solar energy is abundant throughout the year in Malaysia and road pavements receive a high amount of daily sunlight, providing a significant opportunity to generate energy that would have otherwise been 'wasted'. Hence, seeing such potential opportunities and coupled with Sunway sustainability efforts, this solar paver project is initiated by incorporating solar cells in interlocking concrete pavers (ICP) for future road pavement.

This research investigates the suitability and durability aspects of solar pavers integrated with electricity transmitting capabilities. The project's scope of work includes collaboration with universities, industries, and solar manufacturers to develop robust solar paver units which are able to transmit electricity effectively to storage batteries. The project also covers production prototypes, case studies, mock up samples and eventually road trials.

The research addresses the following concerns/objectives:

- i. Evaluation of energy performance of ISCP
- ii. Evaluation of mechanical performance (strength, grip and resistance) of ISCP
- iii. Feasibility study of direct application of ISCP on existing pavement
- iv. Identification of potential markets for the use of ISCP

The candidate will be accountable to the Head of School of Engineering for research program responsibilities and outcomes, reporting to the Project Leader.

A Level A Graduate Research Assistant (GRA) academic is expected to carry out independent and/or team research within the field in which he/she is appointed and to carry out activities to develop his/her research expertise relevant to the particular field of research

## **Key result areas and responsibility**

**Specific duties required of a Level A Graduate Research Assistant include:**

- conducting research and publishing scholarly papers in support of the school's research strengths
- contribution to the preparation or, where appropriate, individual preparation of research proposal submissions to external funding bodies
- involvement in professional activities including, subject to availability of funds, attendance at conferences and seminars in the field of expertise
- administrative functions primarily connected with her/his area of research
- co-supervision, or where appropriate, supervision of the program of study of postgraduate and final year undergraduate students

## **Key selection criteria**

1. a graduate in the specified engineering discipline area or closely related subject field, or evidence of submission, with a record of demonstrable scholarly and professional achievement and significant experience in the relevant discipline area;
2. ability to undertake quality research in the area of specialisation including a record of refereed publications;
3. the commitment and potential to undertake independent research and professional work and to generate research and industry funding;
4. ability to supervise research and/or professional projects;
5. evidence of ability to operate effectively as a team member;
6. willingness and capacity to contribute to collegiate activities related to research;
7. ability to perform in research (in terms of research inputs and outputs) and in education (in terms of engagement and innovation) at levels expected for the discipline and academic level at Sunway campus;
8. expectation of making a primary contribution to existing/future strengths of the academic discipline at Sunway campus in consistency with the campus mission

## **Other job related information**

***As necessary, to attend:***

- Monash University Malaysia campus Open Day
- University enrolment and induction sessions
- After office hours campus and school functions
- Professional accreditation related activities

## Further Information

Confidential enquiries regarding the position may be made to:

<b>Name/Position</b>	<b>Discipline</b>	<b>Contact Details</b>
<b><i>Dr Daniel Kong</i></b> Project Leader	Civil Engineering	Tel: +603-5514 4950 ( <i>Direct Line</i> ) Email: daniel.kong@monash.edu