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PhD Scholarships in Computer Science and IT, RMIT University, Australia

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The School of [Computer Science](#) and IT is offering nine PhD scholarships to high achieving [international](#) and domestic students for various areas of research.



This School is internationally recognised for [its](#) research strength and is ranked in the top eight Australian universities for Computer Science and Information Systems (according to QS World University Rankings).

Value and duration

There are nine scholarships available valued at up to \$25,000 per annum for three years (no extension possible). International candidates may be eligible for a tuition waiver.

Eligibility

To be eligible for this scholarship you must:

- have an honours/master degree in the area of Computer Science or related disciplines
- meet RMIT's PhD entry requirements or
- be studying a PhD in RMIT's School of Computer Science at RMIT in [Melbourne](#).

How to apply

To apply for one of these scholarships, you must complete an application consisting of a:

- a one page research proposal outlining your interest and suitability for the above projects
- a detailed curriculum vitae and the names
- contact details of two referees.

Submit your application via email directly to Associate Professor Xiaodong Li (xiaodong.li@rmit.edu.au).

Close date

Applications close **30 September 2013**.

Further information

The nine PhD scholarships available for PhD research are in the following areas:

1. **Web service design for [transportation networks](#):** This project involves design of service-oriented [management](#) infrastructure for managing the databases and applications of the multimodal transportation networks. Web services act typically as the building blocks for Service-Oriented Architectures (SOA). Those building blocks need to be designed in an efficient and effective manner to provide a competitive service. During this process, it is important to investigate the design issues related to granularity, abstraction, generality, etc. Similarly, it is also important to evaluate the functional, non-functional and behavioral properties of web services to produce an optimum design. Therefore, developing a rigorous foundation that would provide sound design is paramount. It will help to reduce the effort of integration, minimize the impact of change, deliver appropriate levels of granularity, abstraction and generality, etc. In addition to RMIT's PhD entry requirements, candidates should have background in a Computer Science or related discipline.
2. **Multiobjective optimization and data mining for journey planning:** Multi-objective optimization has proven to be successful in solving a wide range of real-world optimization problems. This project will investigate a multi-objective and evolutionary [computing](#) approach to journey planning on real-world data for a metropolitan transportation network. The project will aim to develop a journal planner that will produce tailor-made solutions

based on preferences information collected from passengers. In addition to RMIT's PhD entry requirements, candidates should have strong artificial intelligence, machine learning, data mining, and optimization background. Previous research experience in evolutionary multiobjective optimization (evidence of peer-reviewed publications) is highly desirable.

3. **Engineering optimization with Swarm Intelligence techniques:** This project involves developing and improving multiobjective particle swarm optimization (PSO) algorithms for challenging real-world engineering optimization problems. More specifically, the project will provide solutions to optimizing design parameters related to a composite fabrication process. Design solutions will be evaluated using a CFD ([Computational](#) Fluid Dynamics) model. This project will be carried out in collaboration with the [aerospace](#) engineering school. In addition to RMIT's PhD entry requirements, candidates should have a strong background in Computer Science or engineering discipline.
4. **Machine learning and data mining applied to theme park game-play experience:** This project will investigate interesting areas at the intersection of machine learning, games design of virtual-physical play and human-computer interaction. It will delve deep into how can artificial intelligence for computer games be used to produce a big leap in the state-of-the-art for theme park attractions: it will do so by learning from demonstrations of real players that can then be used to iteratively refine the design of sophisticated virtual-physical play, a notion that exceeds current definitions of augmented or virtual reality. The PhD candidate for such a project will need to have a strong command of machine learning and AI (for computer games), an inclination towards games design and the willingness to work on problems with humans-in-the-loop. Moreover, strong fluency in games and/or graphics programming is necessary i.e., C/C++, scripting languages for games and some high-level games APIs such as Unity3D, Unreal engine, etc. This PhD scholarship will be available only to Australian citizen or permanent resident.
5. **Answering Real-time Questions from Arabic Social Media:** Systems designed to help users answer questions have traditionally focused on analyzing formal content (e.g., full web pages and news articles) to find answers (or nuggets) to asked free-text questions. However, little attention has been given in building those systems to analyzing online informal content (such as millions of posts and tweets that are created daily on Facebook and Twitter). The rapid increase of popularity and interest in that type of media, especially in the Arab world, as both conversational and information dissemination channels, makes it a potential rich source of answers to real-time questions. In this proposal, we plan to address the problem of answering users' questions from Arabic content in social media. While the type of data allows new user-centric questions to be asked (e.g., what are the different opinions on a decision made by a national figure right after it was made), it also opens up new challenges, such as dealing with different dialects, mixed languages, and conversational content, in addition to the unique characteristics of the Arabic language. We propose to explore the solution space from several different perspectives, e.g., ranked retrieval, topic modeling, and information visualization. In solving the problem, we plan to build a scalable open-source real-time system that answers given questions while providing plausible explanations of selecting the presented answers. Pre-requisites: Experience with search, retrieval, and/or summarisation of text would be preferred. Ability to read and write Arabic, also valuable.
6. **TRIBES: Tracking indoor information behaviour:** Supplying the individual information needs of online users is well understood but a new frontier is on the horizon. It is the servicing of information seekers in large indoor areas such as museums, corporate headquarters, airports, shopping malls, and university buildings. Here activities in the space drive and define demands for data and this is a new challenging area of research. Accurate information provision requires tracking of visitors that is both privacy preserving and practical. Using the unexplored approach of passively tracking the Wi-Fi signals of mobile devices we will create a system that can acquire, synthesize and derive location information to support indoor space management and deliver personalised content to users. Pre-requisites: Experience with search, retrieval, and/or spatio-temporal analysis of data.
7. **Sub-collection retrieval: understanding and improving search engines:** Modern search engines need to find useful answers from vast collections of diverse documents. Currently, a single ranking function is used to identify candidate answers. However, our recent pilot work has shown that using different ranking approaches for different parts of a document collection has the potential to significantly boost search performance. This project will analyse different definitions of sub-collections, and study which features of ranking functions lead to different performance on distinct types of documents. This new knowledge will lead to a deeper understanding of search systems, and be used to create new ranking approaches, substantially improving on current search techniques, and benefitting all users of such tools. Pre-requisites: Experience with search, retrieval, and/or evaluation of IR systems.
8. **Big data analytics:** Big data is a focus of interest, both in academia and the industry. Most people characterize big data as data with the following properties:
 - Big volume: The size of the database is too large to manage with current tools.
 - Big velocity: The data is arriving too fast for systems to handle.
 - Big variety: The data is coming from too many disparate, heterogeneous sources.
9. **Big data medical analytics:** The project involves data mining of the medical records of a very large public hospital. The work could involve medical images. Preference will be given to someone who has a first class Honours or equivalent, and could start as soon as possible. The project best suits an Australian citizen or permanent resident.

For further information, contact [Associate Professor](#)

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