

# Template for adverting PhD project on FindAPhD.com

\*\*\*Please read accompanying guidance notes\*\*\*

<b>Department</b>	School of Engineering and the Built Environment
<b>Supervisors</b>	Yuyang Zhou Goh Keng
<b>Funding Status</b>	Funded PhD Project (Worldwide)
<b>Application Deadline</b>	14/04/2022
<b>Project Title</b>	Novel stochastic control method for a class of complex networks

**PROJECT DESCRIPTION**

Complex systems, which contain large ensembles of elements interacting with each other and are affected by noises and uncertainties, have become one of the major research fields due to their presence in the real life. Systems such as electrical power grids, cryogenic propellant loading systems, and social, biological, economic systems can all be regarded as complex systems. The main characters of complex dynamical systems including,

- The complex systems are high dimensional, usually contains large numbers of mutually interacting quasi independents nodes;
- Their structures are complicated, usually nonlinear and inherent some complicated model such as the multiple modes switching, data loss, ext.
- The systems usually subjected to high uncertainties, such as external disturbance, structure randomness, and system noises, ext,

These characters of complex networks bring challenges in the systems analysis, estimation, and especially control.

The project aims to develop some novel frameworks for reliable, robust, and responsive control to overcome the aforementioned challenges of large-scale and complex dynamics. The framework will be based on a hybrid decentralised architecture of mutually-interacting quasi-independent subsystems which are subjected to a high level of randomness. Moreover, the proposed control frameworks will be demonstrated on power systems, formation control systems, robotic systems or other real-life-based control systems. This project is suitable for people who have basic control theory knowledge and probability theory knowledge. The applicants should have good mathematical skills and programming skills. The c programming skill is desirable but not essential.

**Academic qualifications**

A first degree (at least a 2.1) ideally in Control Systems, Electrical Electronic Engineering or Mathematics with a good fundamental knowledge of control theory, probability theory, and electrical engineering.

**English language requirement**

IELTS score must be at least 6.5 (with not less than 6.0 in each of the four components). Other, equivalent qualifications will be accepted. [Full details of the University's policy](#) are available online.

**Essential attributes:**

- Experience of fundamental control theory expercise, mathematical modelling of systems, matlab coding
- Competent in BEng or MSC
- Knowledge of probability theory and control theory

# Template for advertng PhD project on FindAPhD.com

**\*\*\*\*Please read accompanying guidance notes\*\*\*\***

- Good written and oral communication skills
- Strong motivation, with evidence of independent research skills relevant to the project
- Good time management

**Desirable attributes:**

- Probabilistic modelling
- Control design of nonlinear systems.
- Design of consensus algorithms
- Neural network
- C programming
- Power system knowledge

<b>Indicative Bibliography</b>	`
<b>Funding notes</b>	This project may be funded by a scholarship of the School of Engineering and Built and Environment. Please see <a href="http://www.napier.ac.uk/research-and-innovation/research-degrees/application-process">School-funded PhD scholarships – RESEARCH AND INNOVATION (napier.ac.uk)</a> for information on the scholarships and how to apply for them.
<b>Enquiries</b>	For informal enquiries about this PhD project, please contact Dr.Yuyang Zhou, Y.Zhou@napier.ac.uk
<b>Web page</b>	<a href="https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process">https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process</a>

<b>School RDPL signature</b>	
<b>Date</b>	Click here to enter a date.
<b>School DOR signature</b>	
<b>Date</b>	Click here to enter a date.