



Faculty of Engineering, Computer and Mathematical Sciences

NONLINEAR ULTRASONIC GUIDED WAVE TECHNIQUE FOR INSPECTING INACCESSIBLE AREA OF STRUCTURES

Up for a challenge? Join us to work on a research project with the School of Civil, Environmental & Mining Engineering

At a Glance

Who can apply?

- Australian Citizens
- Onshore International students
- Permanent Humanitarian Visa Holders
- New Zealand Citizens

Industry partner or funding body

- Australian Research Council

Program of Study available

- Doctor of Philosophy (PhD)

Total annual stipend amount

- \$28 597pa (2021 rate, indexed)

Start date

- Open until filled

About the project

This PhD scholarship is funded by Australian Research Council – Discovery Project with the aim at developing next generation non-destructive inspection techniques using nonlinear ultrasonic guided wave. The Discovery Project has two

main tasks (i) development of non-destructive inspection techniques, and (ii) development of advanced actuation and sensing system. This project will focus on Task (i) development of non-destructive inspection techniques using nonlinear ultrasonic guided wave for integrity inspection at inaccessible area of structures.

Latest findings have shown that nonlinear features of ultrasonic guided waves are promising for early damage detection. This allows earlier degradation predictions of materials and hence, it can provide more efficient structural integrity management.

This PhD project will focus on developing a robust and reliable damage detection method that can fully utilise the information of the nonlinear features of ultrasonic guided waves. The development will use the

latest numerical simulation techniques and state-of-the-art equipment at Structural Health Monitoring Research Group at The University of Adelaide.

The successful development of the early damage detection techniques in this project will provide a tool that will enable engineers to transition from the current practice of costly scheduled inspection to the more cost-effective approach of condition-based maintenance, thereby resulting in significant cost savings for Australian operators of a wide range of infrastructure such as civil, mechanical, aerospace structures, as well as increased competitiveness for Australian manufacturing industry.

Eligibility criteria

- Students with a relevant Bachelor degree with First Class Honours, or a Masters degree that contains a significant (and relevant) research component with equivalent academic performance. Students who hold a degree in Structural, Civil or Mechanical Engineering will be considered favourably.
- Students with interested in structural health monitoring, nondestructive evaluation and infrastructure monitoring.
- Applicant are expected to have a solid background in structural mechanics/dynamic/acoustic and numerical modelling of structures (e.g. finite element modelling).
- Students with well-developed written and verbal communication skills will be considered favourably.

Benefits

- Work alongside world leading researchers in two Schools, Civil Engineering and Mechanical Engineering
- Access to authorised travel and research project funds available

- Our CaRST program: Free professional development to enhance your employability skills
- No Tuition fees! These are waived for eligible candidates
- Access state of the art technology
- Become a field expert and make a real and contribute to solving global challenges
- Publish your contributions and impact our communities and society.

How to apply

- Complete an [expression of interest](#) and email together with a copy of your CV and transcripts to A/Prof. Alex Ching Tai Ng (alex.ng@adelaide.edu.au)
- Once your initial eligibility assessment is approved, formally lodge an application for admission and scholarship via the Adelaide Graduate Centre 'How to Apply' [link](#). **Application dates are listed on the website.**

Researcher Profiles

The project will be supervised by A/Prof Alex Ching Tai Ng at School of Civil, Environmental & Mining Engineering, and Prof Andrei Kotousov at School of Mechanical Engineering. You can find out more about them by visiting A/Prof Ng's [Researcher Profile](#) and Prof Kotousov's [Researcher Profile](#).

More about ECMS

The Faculty of Engineering, Computer and Mathematical Sciences is home to world-class research institutes and centres, and internationally renowned academics at the cutting edge of research and discovery.

We are a thriving centre of learning, teaching and research in a vast range of engineering disciplines, computer science, machine learning and high-level mathematics as well as designing Human-centred, sustainable futures in

our School of Architecture and Built Environments.

Many of our academic staff are leaders in their fields and graduates are highly regarded by employers.

Learn more about the Faculty of Engineering, Computer and Mathematical Science's Research capabilities at: <https://ecms.adelaide.edu.au/research-impact>

The University of Adelaide is an Equal Employment Opportunity employer. Women and Aboriginal and Torres Strait Islander people who meet the position requirements are strongly encouraged to apply.

FURTHER INFORMATION

For a confidential discussion contact:

Name: A/Prof Alex Ching Tai Ng

School of Civil, Environmental & Mining Engineering

The University of Adelaide SA 5005 Australia

TELEPHONE +61 8 8313 1237

EMAIL alex.ng@adelaide.edu.au

WEBSITE adelaide.edu.au

CRICOS 00123M

