



Fully Funded	l PhD scho	larship in	Civil I	Engineering
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Role title:	PhD on Structural Health Monitoring for lifetime extension of Irish wind farms				
School / Department:	School of Civil Engineering				
Location	Newstead Building, UCD, Dublin 4, Ireland				
Award Level	PhD	Position Type:	Full time		
Supervisor	Dr. Abdollah Malekjafarian Dr. Vikram Pakrashi	Start Date:	May 2022		
Project Title:	A comprehensive decision support tool for end-of-life wind turbines of Ireland; Lifetime Extension Decommissioning Repowering Repurposing [WindLEDeRR]				
Research Field/ subcategories:	Civil Engineering/ Wind Energy/ Structural Dynamics				
General enquiries Email:	abdollah.malekjafarian@ucd.ie				

## The WindLEDeRR project:

Wind turbines have life expectancy of about 20 to 25 years. About 28% of the European wind power are currently older than 15 years which means that they will soon reach the end of their designed service life. Similar to other European countries, there will be a significant number of wind turbines in Ireland reaching their end of life beyond 2025. This is estimated as 500 turbines by 2025 and 1000 turbines by 2030. WindLEDeRR is a three-year project funded by Sustainable Energy Authority of Ireland (SEAI) to develop a comprehensive decision-making tool for end-of-life wind turbines in Ireland through life assessment for the critical components of wind turbines including foundation, tower and blades.

# PhD role description:

In this project, a Structural Health Monitoring data analytics and interpretation framework for lifetime extension of Irish onshore wind turbines will be developed. This will include processing of currently available data from wind farms and recommendations for installing new sensing systems in future, including using these systems for model updating. The successful candidate will develop and implement a novel multi-sensor analysis to guide sensor placement strategies for lifetime performance requirements of these farms. This PhD will thus provide long term and on-demand (including real-time needs) information about the current structural condition of a turbine and will be ultimately used to develop a fatigue assessment framework with sensor placement guidelines and recommendations. This framework will improve our understanding from the remaining life of the turbine and extend our capability of translating ideas of monitoring to practice.

In-house training and career support will be provided by the research team, along with extensive support through academic and industrial networks in this topic. The member will be working with

several researchers on the topic of renewable energy, in a multi-disciplinary and multi-cultural environment.

## Essential qualifications/skills knowledge:

- Candidates must have an honours Level 8 degree in science or engineering or a related discipline.
- Good communication and writing skills.
- Good time management skills.
- Aptitude for multidisciplinary research approaches.
- Background in engineering (Civil Structural/Mechanical).
- Fluent in English. UCD Minimum English Language Requirements (<u>http://www.ucd.ie/registry/admissions/elr.html</u>)

## Desirable qualifications/skills knowledge:

- Masters in Civil/Structural/Mechanical/Engineering with a strong research component or an exceptional undergraduate demonstrating research evidence
- A strong foundation in numerical and statistical methods for both anomaly detection and system identification for inverse problems
- Ability to work with numerical suites (e.g. Matlab, Mathematica, Python, R etc.)
- Background in structural dynamics and vibrations including experimental aspects and fieldwork.
- Academic writing skills.

## Behavioural competencies:

- Ability to work as part of a team, including collaboration with other disciplines but also independently.
- Strives for high quality of work and demonstrates commitment to the project.
- Ability to communicate effectively to enable knowledge and technology transfer

## Funding:

The scholarship will be awarded for maximum period of 3 years and funding will cover the following elements:

- A stipend of €18,500 per annum
- Travel/ Consumables/Materials budget
- Tuition fees

## How to apply:

Applicants submit their applications by filling the following online form:

https://docs.google.com/forms/d/e/1FAIpQLSdJk8v45RfHSw0IIMYvJUN0xEsyOd3hgDTKRDVu7zb8zSLIg/viewform?usp=sf\_link

Applications received by email will not be considered.

## Deadline:

The application should be submitted no later than **20 March 2022.**