

Faculty of Engineering

Summer Research Program 2022-2023

Project Title: Renewable energy harvesting from fluid-flow instabilities

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Objective

Flow energy harvester based on flow-induced vibration (FIV), as a novel design motivated by rapidly increasing demand for renewable energy, has recently been received a great deal of research attention. This project aims to develop a prototype power generator to extract energy from FIV of bluff bodies at low-to-moderate Reynolds numbers. This project also aims to gain a good understanding of the fundamental mechanisms associated with flow energy harvesting performance, and to address optimization settings for the harvesting performance.



Project Details

The research project will be conducted in [the Water Channel Laboratory of FLAIR](#). It is required to design and construct an energy harvester based on flow-induced vibration of bluff bodies (e.g., cylindrical cylinders). This energy harvester will be adapted to an existing air-bearing system used for modelling flow-induced vibration. The power extraction performance and efficiency will be assessed under various conditions of the flow speed and structural properties (e.g., the structural damping ratio). The research project is supported by an *Australian Research Council Discovery Project*.

Prerequisites

To be considered, you must at level three or above in your degree, with a minimum of 48 credit points remaining, and must have a weighted average mark greater than 80%. You will demonstrate a strong understanding of fluid mechanics, preferably with experience in CAD design (e.g. using Solidworks). If shortlisted, you are required to attend an interview.