

- Position: Research Placement
- Location: Glasgow, UK
- Duration of the internship: 10-12 weeks
- Starting date: Flexible, likely around beginning of June
- Working pattern: Generally 9-5, 5 days a week, but flexibility is offered

Strathclyde Game Changers - 2022 Summer Research Placement with SSE

The University of Strathclyde is constantly looking to improve its research output and working environments. A key aspect of this is ensuring we build teams made up of diverse groups of thinkers and problem solvers, collaborating in supportive and inclusive environments. We know that the best results are achieved when different voices and different points of view are all brought together. In order to foster the next generation of **game changing** researchers, we have therefore established a program of internships to demystify research and ensure the possibilities of academia are open to all.

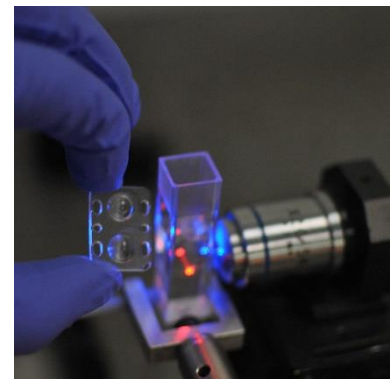
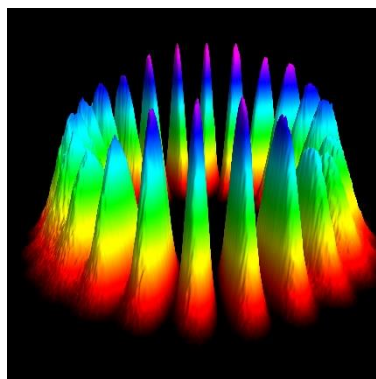
The Game Changers program offers fully funded 8-12 week internships and placements, in engineering disciplines in, to students sitting between first year undergraduate and masters degree level studies. Each project sees a candidate joining a Strathclyde research team and working alongside them throughout. Interns will have a chance to see, experience and contribute to real life research, gaining valuable insight into PhD studies and academic life. They will also learn valuable skills which can aid them in their studies and future projects. Most importantly, these internships help bring the world of research out from behind closed doors, exposing new minds to a world of possibilities where their skills and insights can provide valuable contributions in the years to come.

The project advertised here offers an exciting opportunity to work with a Strathclyde research team while being embedded within the SSE Renewables Technical Analysis team. This promises to provide the candidate with a unique perspective on research and innovation resulting from collaborative efforts between academia and industry.

In order to apply, please submit an up-to-date CV and covering letter which details 1) why you are excited by this project 2) why you are keen to participate in a scheme designed to help improve the diversity and inclusiveness of research teams.

Application documents should be submitted to edward.hart@strath.ac.uk as soon as possible. The submission deadline is 5pm on Mon 28th March 2022. Interviews will take place during w/c 4th April 2022. If you have any questions or would like to discuss this opportunity, please get in touch via the same address.

Project description overleaf //



Project: Weather window analysis for offshore renewable energy technologies

Background and motivation: While the cost of offshore wind has decreased in recent years the latest contract for difference auctions (2019) saw record breaking prices of £ 39.65, which is below the wholesale price on the electricity market. However, operation and maintenance (O&M) can account for up to 1/3 of the Levelised Cost of Energy (LCOE). This is therefore a key area of cost reduction, and one of the few cost elements of a project which can be changed once the asset is operational.

Having an understanding of weather window (time periods within which an offshore wind farm may be accessed) lengths and behaviour for a site can have a significant impact on all operational aspects of the site from turbine installation to decommissioning. As the distance from shore increases and the offshore environment become increasingly hostile (with respect to access and safety for personnel and equipment) the available periods of accessibility to a site become increasingly important. By having an estimation of these periods and lengths of access available, more proactive maintenance planning can be scheduled. This is therefore the focus of the proposed project.

What will you do? You will have the unique opportunity to collaborate with both academia and industry. The aim of this project is to create a weather window estimation tool based on known inputs to an offshore site such as bathymetry, distance to shore, vessel type and turbine technology type (fixed or floating). The project will use the sites identified within the ScotWind leasing round as examples. The project will include:

- 1) Collection of public and commercial datasets for ScotWind sites for determining time based general accessibility
- 2) Creation of a database of known inputs for each of the sites
 - i. Distance to shore, average depth, average wave height, average wave period, expected turbine technology type, etc.
- 3) Identification of weather windows for known sites
- 4) Analysis and visualisation of weather windows
- 5) Analysis of features of weather window histograms via comparison with known distributions
- 6) Determination of whether parameters describing weather window distributions can be estimated/predicted using available inputs
- 7) Analysis to link weather window distributions with the impact they have on maintenance strategies for different maintenance vessel types.

The main output of the project will be a model which can predict weather window behaviour for a site based on known parameters. If time permits, sites will be split geographically, by distance to shore, by depth, etc. in order to determine key performance features which influence weather window length distributions. This model will allow more economical scheduling of preventive maintenance activities and will assist decision making at SSE Renewables. In addition, it will form an important component in ongoing research initiatives at Strathclyde in this area.

The researcher will be fully supported by both Strathclyde and SSE Renewables throughout, with each partner assigning a dedicated project supervisor.

Required skills and experience:

This project is best suited to a student currently studying an engineering, mathematics, physics or other STEM degree. Candidates should have demonstrable communication and problem solving skills as well as a strong interest in renewables. Candidates should have existing coding experience, ideally in Matlab or Python. An understanding of statistics, probability and/or data analysis techniques is also desirable, but not essential.

Diversity statement: If you've got the right skills for this role then we want to hear from you. We encourage applications from candidates meeting the above criteria regardless of age, disability, gender identity, sexual orientation, religion, belief or race.