



TRUSS
www.trussitn.eu

TRUSS (Training in Reducing Uncertainty in Structural Safety) is a Marie Skłodowska-Curie Innovative Training Network funded by the European Union under the Horizon 2020 Programme. TRUSS is structured into taught modules combined with original and impactful research supported by secondments that will give the successful candidates significant insights and exposure to research and innovation in both academia and industry.

EARLY STAGE RESEARCHER VACANCY:

ESR 4



Project Title:
**PROBABILISTIC OPTIMIZATION OF THE DESIGN OF OFFSHORE
WIND TURBINE TOWERS**

Host

Trinity College Dublin

Address

School of Civil, Structural and Environmental Engineering; TCD, College Green, Dublin 2

Country

Ireland

Main Supervisor

Prof. Alan O'Connor

Background

The growth of the global wind energy sector is undisputable with 215GW of installed capacity as of June 2011 (over 100 times the installed capacity of 1990). As the industry strives to innovate by reducing the unit price of wind generated electricity there is an ever-increasing requirement for research in this domain. Current models are rated up to 7.5MW with hub heights of up to 150m. Due to the wind shear effect, taller hub-heights result in greater and more stable wind inflow speeds. Coupled with the fact that larger turbine units will generate greater amounts of electricity, this means that wind turbine sizes will tend to increase for the foreseeable future. As these hub heights increase, the size of the wind turbine units they support continue to get larger, wind farms are located in more severe offshore environments and in active seismic zones, the necessity to employ advanced design techniques, such as probabilistic methods, to optimize structural design becomes apparent.

Objectives

The objective of this project is to employ the principles of structural reliability theory and probabilistic analysis to optimize the design of offshore wind turbine towers considering possible combinations of extreme environmental loads such as wind and wave effects with natural hazards such as earthquakes. Overall the aim will be to provide a methodology for



the development of robust designs which minimize the risk to power supply interruption during the lifetime of the installation.

Expected Results

Methodology for **robust wind turbine designs** which minimize the risk to power supply interruption during its lifetime.

Secondment

This position involves a secondment of a few months to *Lloyd's Register*. Based on their experience, *Lloyd's Register* have produced guidance documents covering all aspects of wind farm certification from initial design through construction and onto operation. The ESR will gain expertise in the treatment of safety issues related to load and capacity, and in particular, that based on the concept of limit states to address here for wind turbines through reliability approaches.

Specific Requirements

- At the date of closure of appointments, candidates must have obtained, or finalize within 3 months, a 4-yr Bachelor or a Masters degree in Engineering, with a strong background in Structures.
- Prior knowledge and skills in programming are desirable but not mandatory.
- A strong background in statistics and probability theory.
- We are looking for candidates with a strong motivation to pursue a career in engineering and an open mind for new approaches and a lot of team spirit. Creativity and level of independence will be considered.
- Solid written and oral communication skills in English are prerequisites of any successful application.

Eligibility Criteria

- Researchers can be of any nationality and age.
- All recruited researchers **must be Early-Stage Researchers (ESRs)**. A ESR shall, at the time of recruitment by the host organisation, **be in the first four years of their research careers** and not yet have been awarded a doctoral degree. The four years start to count **from the date when a researcher obtained the degree which would formally entitle him/her to embark on a doctorate**.
- Researchers are required to undertake transnational **mobility** (i.e. move from one country to another) when taking up their appointment. One general rule applies to the appointment of researchers: **At the time of recruitment by the host beneficiary, researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of their host beneficiary for more than 12 months in the 3 years immediately prior to the reference date. Note that the *mobility* rule applies to the beneficiary where the researcher is recruited, and not to beneficiaries to which the researcher is sent or seconded.**
- For all recruitments, the eligibility and mobility of the researcher will be determined at

the time of their (first) recruitment in the project. The status of the researcher will not evolve over the life-time of a contract.

Salary and Working Conditions

- Each position is for a period of 36 months. These positions will be available from August/September, 2015. The Marie Skłodowska-Curie programme offers highly competitive and attractive salary and working conditions. Exact salary will be confirmed upon appointment. It consists of a living allowance (= 37320 euro/year [the Marie Skłodowska-Curie rules apply a correction factor to this amount to allow for the cost of living in different countries]) + a monthly mobility allowance (= 600 to 1100 euro/month depending on the family situation).
- Furthermore, PhD tuition fees for the ESR are covered and the research project is aimed at defending a thesis and obtaining a PhD degree. In addition to their individual scientific projects, all positions will benefit from further continuing training, which includes internships and secondments (All ESRs will be seconded at least once during this period at another partner site), a variety of training modules as well as transferable skills courses, active participation in workshops and conferences, and exposure to large enterprises, SMEs and Universities from different European countries involved in TRUSS.

Application Procedure

- (1) Check you meet **Eligibility criteria** and **Specific requirements for the ESR position** project/s you are applying for.
- (2) Prepare the following **application documents** (in English):
 - a. **A curriculum vitae**, including contact details, education (at University level and other), work experience, prizes/awards, language skills, etc... (max. 2 pages). The CV should reflect a representative array of achievements and qualifications appropriate to the post for which application is being made.
 - b. **Official academic record** of undertaken courses & grades for Bachelor (and Master if required in specific criteria) degree.
 - c. **A motivational letter** in which the applicant describes his or her motivation to pursue postgraduate studies and to conduct the research project/s applied for. Mention the ESR project number or numbers (in the latter indicate order of preference if any) on your motivational letter and the subject of the email.
 - d. **A reference letter**.
- (3) Email your application documents as attached files to: trussitn@ucd.ie **before the 1st May 2015 deadline** and mention the ESR project number/s you are applying for in the subject line.
- (4) The documents provided will be used to select the best candidates. Successful candidates will be informed **before 29th May 2015**.

For more information on a position with TRUSS, please check
www.trussitn.eu/vacancies or email trussitn@ucd.ie