

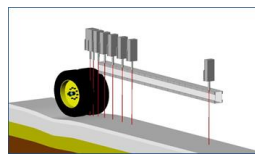


TRUSS
www.trussitn.eu

TRUSS (Training in **R**educing **U**ncertainty in **S**tructural **S**afety) 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 12



Project Title:
**BRIDGE DAMAGE
DETECTION USING AN
INSTRUMENTED VEHICLE**

Host

University College Dublin (UCD)

Address

School of Civil, Structural and Environmental Engineering; UCD, Newstead, Belfield, Dublin 4

Country

Ireland

Main Supervisor

Prof. Eugene OBrien

Background

A deflectometer is a specialist device used to determine the stiffness of a road pavement. The most common form of the apparatus is the well-known Falling Weight Deflectometer (FWD) but, in recent years, new 'traffic speed' deflectometers (TSD's) are being developed. The Danish company, *Greenwood Engineering* are the main developers of TSD's in the world today and have supplied vehicles to the UK, Poland and Italy where they are currently being trialled. *The concept of 'inspecting' bridges for damage using a vehicle travelling at full highway speed has emerged in the past decade. While it has shown promise in simulations by UCD and in scaled laboratory models, it has yet to be proven in the field.* TRUSS will further develop and test this promising technology that may allow the **monitoring of safety of many bridges by simply driving the TSD over them.**

Bridges vibrate in response to passing vehicles and the nature of this vibration changes when the bridge is damaged. The bridge vibration excites the TSD vehicle and it is *this vehicle vibration that will be used as an indicator of bridge damage.* A measurement taken directly on the bridge is clearly a more direct approach than using a measurement taken on



a vehicle to infer information about the bridge.

Objectives

- To exploit the ability of a TSD vehicle to be used as a bridge damage indicator.
- To develop computer algorithms that simulate the vehicle/bridge dynamic interaction.
- To demonstrate, in simulations, that the TSD measurements are sensitive to bridge damage.

Expected Results

Tools to assess **bridge safety based on sensors mounted on vehicles.**

Secondment

This position involves a secondment of some months to *Greenwood Engineering* in Denmark (designers of the TSD). The ESR will investigate how a bridge responds to a TSD vehicle, and relate this to bridge condition, deterioration and damage.

Specific Requirements

- At the date of closure of appointments, candidates must have obtained, or will obtain within 3 months, a 4-yr Bachelor's or Master's degree in Civil or Mechanical Engineering, with a strong background in Structures and/or Dynamics.
- Prior knowledge and skills in Matlab programming are desirable but not mandatory.
- 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