



Early Stage Researcher with PhD enrolment

Sustainable **M**ulti-functional **A**utomated **R**esilient **T**ransport **I**nfrastructures **ETN** will bring together a stimulating platform where the stakeholders of the transport infrastructure sector will work alongside world-wide experts in smartening of systems (developers of high-tech sensors, advanced monitoring equipment, automated structures, etc..) with direct support from the roads, railways and airports managers. As a result, SMARTI ETN will create a new generation of highly-skilled and appealing professionals that will be in great demand in this rapidly expanding field and will benefit Europe and developing countries. *Do you want to be one of them?*

Project 12

“SuRoMa”: **S**ustainable **R**oad **M**anagement through **L**ow **C**ost **T**echniques (WP3-ESR12)

University of Palermo (Italy)



UNIVERSITÀ
DEGLI STUDI
DI PALERMO

Expected Collaborators

ELAB SRL (Italy), The University of Nottingham (UK), Comune di Palermo (Italy)



Project Summary/Objectives

The objective of the PhD research project consists in developing a low cost tool being able to ensure the best resources use for road pavement maintenance and rehabilitation. In the past few years, there has been a drastic increase in the use of Image-Based Modelling (IBM) low cost techniques to create high metric and visual quality, reality-based 3D models. The main innovative aspect lies in the use of a simple and low cost hardware (camera or mobile-phone) and software for the distresses identification and therapy. The other goal is to develop a new metric to evaluate the real pavement condition that does not cover traditional parameters as IRI (International Roughness Index) and Skid Resistance. Rather this metric should directly consider the actual distresses on the pavement by analysing and measuring them with the help of Artificial Intelligence tools as Fuzzy Logic, Neural Network, etc. Following tasks are forecasted:

- Review literature on road distresses, photogrammetric survey and use of Structure For Motion software
- Advanced knowledge of camera and drone system
- Data acquisition and analysis on road distresses through 3D modelling software
- Implementation of interactive 3D catalogue for ready-use from the municipality of Palermo (MUNPA)

Environment

The research is carried out within the framework of the Marie Curie European Training Network 'SMARTI' with opportunities to join network wide training events and international collaboration. The candidate will work within the Work Package SMARTI Guidelines which investigates innovative transport infrastructure modelling and methodologies for the creation of guidelines for roads and railways management. Furthermore the candidate will benefit from collaborative research with 14 similar research positions in the network.

The project will be developed through planned international collaborations with at least two international partners. The University of Palermo will provide expertise with image based modelling technique, road engineering and asset management. The partnership with strategic partners will provide:

- ELAB: Advanced image analysis and use of drones
- The University of Nottingham: Theory and application of fuzzy logic, neural network and genetic algorithm

- Comune di Palermo: Implementation of interactive 3D catalogue for the administration of Palermo.

The successful applicant will be recruited by University of Palermo and will register for a 3 year PhD at the same institution. The total funding available for each position is in line with the Marie Curie ETN Scheme, and comes to €37320 per year. This amount will be multiplied by a country factor¹ and on top an extra allowance will be available to cover mobility expenses. The fellows will pay taxes according to the rules of the country of recruitment. A career development plan will be prepared for each fellow in accordance with his supervisor and will include training, planned secondments and outreach activities.

Application Process

(1) SMARTI ETN will perform the recruitment of all the Early stage Researchers (ESR) through **smartietn.eu** website

(2) Check you meet Eligibility criteria and Specific requirements for the ESR position project/s you are applying for.

(3) Prepare the following application documents (in English):

1. 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.
2. Official academic record of undertaken courses & grades for Bachelor (and Master if required in specific criteria) degree.
3. 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.
4. A reference letter.

(4) Upload your documents in smartietn.eu before the 1st June 2017 deadline.

(5) The documents provided will be used to select the best candidates. Applications will be analysed by a **selection committee led by the coordinator and formed by both academic and industry partners**. Recruitment procedures will be open, efficient, transparent and supportive, as well as tailored to the type of positions advertised. All Institutions value diversity and are committed to equality of opportunity.

Eligibility Criteria

- Applicants can be of any nationality. They are required to undertake transnational mobility (i.e. move from one country to another) when taking up their appointment. Nationality is therefore not a criterion. Rather the location of the researcher's residence or main activity during the 3 years prior to their recruitment is determining. (*This means: You can only apply to a project which*

¹ Italy factor = 1.067

is hosted in a country in which you did not reside or carry your main activities (such as work or study) for more than 12 months within the last 3 years. This excludes short stays such as holidays or compulsory national service).

- Applicants must be Early-Stage Researchers (ESRs) which means, at the time of recruitment by the host organisation, they must be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree. For research experience it is meant since the date that the graduate has been awarded with a degree allowing him/her to embark on a PhD programme (e.g. date of completing a masters degree).

Specific Requirements

	Essential	Desirable
Qualifications/ Education	<p>Master's degree in Civil Engineering, Computer Engineering and Computer Science, qualifying the candidate for PhD studies.</p> <p>At the time of recruitment, candidates must be in the first four years of their research careers (full-time equivalent research experience after qualifying degree) and have not yet been awarded a doctoral degree</p>	<ul style="list-style-type: none"> • Programing, code writing and application/software developing and design
Skills/Training	<ul style="list-style-type: none"> • Actively manage other stakeholders engaged in the research; also an ability to identify and set achievable targets and deliver to these deadlines. 	<ul style="list-style-type: none"> • Interest in multidisciplinary science: boundary between mechanics, physics and electronics.
Experience	<ul style="list-style-type: none"> • Previous work experience is NOT necessary. <p>However these are essentials:</p> <ul style="list-style-type: none"> • Willingness to think out-of-the-box and use background to adapt into a new context 	<ul style="list-style-type: none"> • Already worked within a research team • Scientific Papers published
Personal Qualities	<ul style="list-style-type: none"> • Ability to work independently • Ability to work efficiently in a team • Pro-active • Good communication skills 	
Other	<ul style="list-style-type: none"> • Fluent in oral and written English. • Ability to present scientific work in oral and written format. 	

Do not wait, apply for this position in the following link

smartietn.eu

Any question on:

this specific project, contact Laura Inzerillo, laura.inzerillo@unipa.it

the SMARTI ETN project, contact Dr Davide Lo Presti, Davide.Lopresti@nottingham.ac.uk

Please note that applications sent directly to these email addresses will not be accepted