



## Position for a Marie-Curie PhD student in Computational Mechanics at Valencia, Spain

The Research Centre in Vehicles Technology (CITV) at the Department of Mechanical and Materials Engineering of the Universitat Politècnica de València (Valencia-Spain) has an opening for a 3-year PhD position under an EU Marie-Curie Initial Training Network (Call: FP7-PEOPLE-2011-ITN) on “*Integrating Numerical Simulation and Geometric Design Technology (INSIST)*”.

The selected candidate will be working in the area of automatic generation of Finite Element models from CT-scan data. Cartesian adapted meshes built over a hierarchical data structure will be used for accurate and computer-efficient models definition.

### **Description**

The objective of the INSIST ITN is the development of the next generation of design/simulation methods based on isogeometric analysis. The idea of isogeometric analysis is to use the same functions that are used to approximate CAD models to approximate the unknown fields for engineering analysis and simulation. The key outcome of this research is a system/methodology that allows the analysis, simulation and design of engineering products in a more efficient way. We aim at extending the isogeometric analysis concept of Hughes and co-workers who focused on the unification of CAD and CAE whereas we intend to generalize this idea to unify pre-processing (in general) and analysis. The research programme is structured into 4 main sub-programmes:

- WP1: CAD Feature Processing (2 individual projects).
- WP2: Pre-Processing and Mesh generation (4 individual projects).
- WP3: Numerical Analysis/CAE (6 individual projects).
- WP4: Voxel based analysis (1 individual project).

WP2 consist of four projects. This post corresponds to project ESR6 within program WP2 and is aimed at devising a methodology for the automatic generation of accurate and efficient Finite Element models from CT-scan data. The main pillar of this development is the use of Cartesian grids, well suited to CT-scan data, with local mesh refinement capabilities via adaptive voxel subdivision for an accurate geometry representation of the geometry with the minimum possible amount of information. An underlying hierarchical data structure of the Cartesian grid will also be essential for computer efficiency. Further model accuracy will be gained by means of the use of NURBs for surface representation.

A suitable candidate should have a degree in Engineering, Computer Science, Mathematics or a closely related subject. They must have proven excellent programming and mathematical skills, and experience in discretisation techniques (FEM, XFEM, GFEM). The successful candidate will participate in a research training network of an EU-funded Marie Curie ITN and will work in a highly interactive international environment with other Marie-Curie PhD students, researchers and industry and will execute part of the work during extended visits at the partner institutions outside Spain.

University Partners Bauhaus Univ.– Weimar, Johannes Kepler Univ. – Linz, Cardiff Univ.

Industrial Partners: Cenaero , InuTech, Simpleware

Associated University Partners: University of California-San Diego, Carnegie Mellon University

Associated Industrial Partners: Transcendata , Numerical Geometry Ltd

**Nr. Job Positions:** 1

**Duration:** 3 years starting immediately



**Research Fields:** Engineering - Mechanical engineering

**Career Stage:** Early stage researcher or 0-4 yrs (Post graduate)

**Research Profile:** First Stage Researcher (R1)

### **Benefits**

The employee will enjoy the benefits of the Marie Curie scheme (Mobility allowance, career exploratory allowance, etc.). See [ftp://ftp.cordis.europa.eu/pub/fp7/docs/rea-annex3-mc-itn-multi-v4\\_en.pdf](ftp://ftp.cordis.europa.eu/pub/fp7/docs/rea-annex3-mc-itn-multi-v4_en.pdf)

Salary: Gross monthly retribution 2,000€/month + mobility allowance. Two extra pays.

### **How to apply:**

Submit application from 26<sup>th</sup>-April-2012 to 10<sup>th</sup>-May-2012, following the instruccions contained in the Official Call.

The Official Call and applications forms in Spanish and English can be found at:

<http://www.upv.es/entidades/SRH/conypi/819325normalv.html>

Please, also send an e-mail to [jjrodена@mcm.upv.es](mailto:jjrodена@mcm.upv.es) indicating when and where the application form was submitted.

### **Requirements:**

Eligibility requirements to the Marie-Curie ITN program states that at the time of appointment, the researcher may not have resided or carried out his/her main activity in the country of the beneficiary for more than 12 months in the 3 years immediately prior to his/her appointment.

Early stage researchers: means researchers who, at the time of recruitment by the beneficiary, have not yet been awarded the doctorate degree and are in the first 4 years (full-time equivalent) of their research careers. This includes the period of research training, starting at the date of obtaining the degree which would formally entitle them to embark on a doctorate either in the country in which the degree was obtained or in the country in which the initial training activities are provided, irrespective whether or not a doctorate is envisaged.

### **Important note:**

According to local regulations, the researcher appointed needs an official Spanish degree. Alternatively, the researchers can apply to this position if they have an official degree recognition/approval (“homologación” in Spanish) of their degrees to an official Spanish degree. Candidates can apply for the approval to a specific degree (for example Ingeniero Aeronáutico, Licenciado en Matemáticas, etc) or for the approval to an educational level: diplomado or licenciado. We recommend the candidates to apply for the approval of their degrees to the Spanish educational level of “licenciado” in the Spanish consulates or embassies using the application form at <http://www.educacion.gob.es/dctm/ministerio/educacion/universidades/educacion-superior-universitaria/titulos/modelos-solicitud/2010-homologacion-1.pdf?documentId=0901e72b8081c31a> .

Approvals to the Spanish degrees of “ingeniero técnico” or “diplomado” will not be accepted for this position. European Community graduates may apply by providing evidence that they have requested the approval. Note that non-European Community graduates will need to present the final resolution of the approval to apply for this position.

See detailed information about this (only in Spanish) at:

<http://www.educacion.gob.es/educacion/universidades/educacion-superior-universitaria/titulos/homologacion-titulos/homologacion-titulos-universitarios.html>