PhD SCHOLARSHIP APPLICATION FORM 2016

ORGANISATION Business Division Business Area	**TECNALIA RESEARCH & INNOVATION** Industry and Transport Division Advanced Manufacturing
Scholarship location Province/Building	GIPUZKOA/Parque Científico y Tecnológico de Gipuzkoa - Mikeletegi Pasalekua, 7-Donostia-San Sebastian
Tutor	Dr. Asun Rivero

SCHOLARSHIP DESCRIPTION

Title: Enhanced Accuracy for Machine-Tooling

Brief Description of Scholarship:

The scholarship will cover monitoring, modelling and accuracy error compensation for machine-tools due to mechanical deformation, thermo-elastic impacts and assembly misalignments.

Scholarship description:

The on-going accuracy improvement of machine-tools is a permanent challenge faced by machine and component manufacturers wishing to maintain their market quota. As a result, the machine design, assembly procedure and error compensation are under constant review and manufacturers demand the involvement of research centres to improve machine accuracy.

Machine-tool accuracy is determined by different factors including: machine manufacturing and assembly defects; impacts caused by different mechanical deformation depending on machine overhang; and machine thermo-elastic deformation depending on internal or external heat sources. This research work will characterise machine accuracy errors, build a mathematical model based on the errors identified and apply correct compensation or correction techniques to mitigate the impact of these errors in accuracy.

Work will be carried out within the framework of a project financed by ETORTEK involving practical application with some machine-tool manufacturers in the Basque Country and in cooperation with the machine-tool team from the Higher School of Industrial Engineering of Bilbao (UPV-EHU) where a PhD can be completed.

Requirements:

The PhD candidate shall meet the following requirements:

- Qualification and speciality: Higher Engineering degree in mechanical speciality
- Languages: advanced English level
- IT skills: knowledge of Python programming language at scientific level is required.
- The following will be a plus:
    - Knowledge of modelling of elastic, thermo-elastic, and thermal systems by finite elements methods
    - CNC (Fanuc, Siemens, Heinhain) at user level knowledge
    - Knowledge of machine signal acquisition through sensors or CNC
    - Knowledge of Metrology
    - Knowledge of optimisation techniques: linear programming, semi-finite programming, dynamic programming, etc.