Postdoc Position on Reverse Engineering and Feature Recognition for NC Machining

The University Research Laboratory in Automated Production (LURPA / Ecole Normale Supérieure de Cachan, France) is recruiting a postdoc.

Start date: Tentatively **October 2012**, although the actual starting date is negotiable.

Type of contract: Fixed term contract (CDD). The term of the postdoc position is one year with an option to renew for up to one year.

Salary: About 2100 EUR net per month (2600 EUR gross), health insurance included (French Social Security system).

Location: This post-doctoral fellowship will be located at the Ecole Normale Supérieure de Cachan, Cachan campus near Paris with frequent displacements carried out at Montreuil.

Subject: Reverse Engineering and Feature Recognition for NC Machining

Objectives:

This post-doctoral fellowship will be part of the "ANGEL" R&D project recently funded by the French Inter-ministerial Fund(FUI)and supported by top French competiveness clusters (SYSTEMATIC PARIS REGION "Systems & ICT", VIAMECA "Advanced Manufacturing" and ASTECH "Aeronautics & Space").
The project is supported by a consortium of 9 partners (AIRBUS, MBD, SNECMA, CADLM, DATAKIT, SPRING Technologies, UF1, LURPA - ENS Cachan and Roberval-UTC). ANGEL aims at developing a new software system for Optimized and Intelligent Industrialization of NC Machining in order to bring productivity gains of about 10%. The expected results (among others) can be summarized as follows
- Capitalization and exploitation of the machining know-how
- Direct conversion of CAM data into optimized and validated machining programs
- Generation of fast, accurate and convergent machining cost estimate
- Modular infrastructure based on standards (STEP-NC, Web services)
- Consideration of Sustainable Manufacturing indicators

This post-doctoral research project aims at developing machining features paradigms, standards (STEP, STEP-NC) and sustainable manufacturing indicators for accurate machining product cost estimate. The objective is threefold: i) proposing and developing techniques for the reverse engineering of NC programs, ii) automated recognition of machining features from CAM data, Virtual Machining (NC Simulation)and NC programs, iii) fast and accurate feature-based STEP-NC compliant cost estimation system.

Work proposed and expected results:

The candidate will complete the following tasks, among others:

- Study of reverse engineering NC programs, extraction and retrieval of geometrical data, state-of-the-art on existing solutions, and study of possible solutions
- Study of feature recognition techniques from multiple and heterogeneous sources (CAD, CAM, NC Simulation and NC programs), multi-geometric representations, state-of-the-art on existing solutions, and study of possible solutions

- Study of Feature-based cost estimation approaches and STEP-NC compliant cost estimation systems, state-of-the-art on existing solutions, and study of possible solutions
- Development of the devised solutions, implementation of tools supporting the approach
- Application of the developed approaches in order to validate our new techniques and tools onto use cases and protocols developed by industrial partners
- Publication of these results into international conferences and journals

Required skills and profile:

Knowledge of feature technologies in engineering applications

Knowledge of geometric modeling and computational geometry (algorithms, data structures)

Knowledge and applications of cost estimation techniques would be appreciated but is not mandatory

Candidates who enjoy programming (C, C++, Python, Java) would be appreciated, as the work is likely to include software development

Applicants must have a PhD in Mechanical Engineering, Manufacturing Engineering, industrial Engineering, Computer Science or a closely related field.

Fluent in English, French is a plus

Proven communication and interpersonal relationships skills, methodical approach, autonomy, team player

Contacts:

Applications and inquiries should be addressed directly to:

Dr. Nabil Anwer

anwer@lurpa.ens-cachan.fr

Applications should include:

- a curriculum vitae (including list of publications)
- a brief statement of the particular contribution you would like to make to the project
- a reference letter by the PhD supervisor
- the names and contact details (postal and e-mail addresses) of two referees.