PhD on “Dynamic product line engineering for runtime re-configuration of component-based self-adaptive software systems” at the Centre de Recherche en Informatique (CRI) at the Panthéon Sorbonne University

The CRI (http://www.univ-paris1.fr/centres-de-recherche/cri/home/) at the Panthéon Sorbonne University (http://www.univ-paris1.fr), in Paris-France, is seeking for a PhD candidate, starting during the period September-November 2015.

Working areas

The successful applicant will carry out his/her PhD in the research areas of dynamic product lines for runtime re-configuration, component-based software engineering and adaptive middleware.

Overview of the PhD. project

For several decades, all software was custom software. Every application was tailored specifically to one customer’s requirements. Software engineers eventually realized that this was an inefficient way to produce software and a way in which it was hard to achieve high quality consistently. So they imagined ways to achieve effective reuse of existing software components in new applications. One of the most effective means to manage software reuse in an industrial context is software product line (SPL) engineering. In particular, product line engineering allows managing a family of applications that share a common architecture. These applications are configured as a set of components that provide core functions, but they will exhibit variability in the features they provide to users because each family member will use a unique set of non-core components bound to the architecture at variation points.

In parallel with advances in software engineering for SPLs, a new generation of middleware and service-oriented architectures has emerged. They are capable to adapt their behavior according to changes in operation or environment conditions, and/or user requirements. This may require a system to adapt dynamically to environmental change in a way that is far more radical than is possible using parametric adaptation. However, there is currently a wide conceptual gap between the capabilities of self-adaptive machinery (expressed in terms of components and services) and requirements (expressed in terms of user or customer needs that can emerge dynamically), with only an emerging understanding of what changing environmental context means.

This PhD. project intends to study this aspect in the context of adaptive middleware and service-oriented architectures. The possible solutions will be empirically evaluated to improve a selected solution that will be implemented into a tool that will be used by software practitioners and other research laboratories around the world.
Funding

This PhD project is fully founded for three years with competitive salaries from a grant of the French Minister of Education. The grant consists in a researcher contract (contrat d’allocation de recherche) during a period of three years, with all the advantages of an employee in France. In addition, successful applicant will be provided with all the material needed to develop the research project and funding for travel expenses, including participation in conferences and workshops, and visits to companies and other research groups. In accordance with French regulations, the doctoral student will be employed as a researcher with a yearly salary of 1635€ per month, after social/health insurance deductions.

Requirements

The candidates shall satisfy the following requirements:

- A master degree in Computer Engineering, Computer Science, Mathematics, or related disciplines.

- Excellent knowledge in component or service-based architecture and programming, self-adaptive software systems, and software modeling techniques.

- Curiosity and out-of-the-box thinking.

- Very good English skills (writing, speaking).

Knowledge of French is welcome because the successful applicant should ensure lectures in English or French. Free French courses at the Panthéon Sorbonne University are available for him/her.

Advisors


Co-advisor: Ass. Prof. Raúl MAZO (https://sites.google.com/site/raulmazo/)

Application

Applications, including any attachments, should be submitted by the 1st of June to the following emails: carine.souvety@univ-paris1.fr, raul.mazo@univ-paris1.fr

The following documents must be attached to the application:

- A short cover letter stating the candidate's motivation to apply, and the reason(s) why they should be selected for the position

- A curriculum vitae

- Bachelor and Master grades (and the corresponding transcriptions if necessary) and certificates

- Two reference letters