

PhD candidate in Computer Science

University of Amsterdam, Faculty of Science – Informatics Institute

The [Informatics Institute](#) at the [University of Amsterdam \(UvA\)](#) invites applications for a fully funded position for a PhD candidate in the area of *Simulation-aided Runtime Optimization of Complex Computer Systems*. More specifically, the PhD student will be involved in the iDAPT research project that is funded by the Dutch Technology Foundation STW and is a cooperation with ASML, the world's largest supplier in the world of photolithography systems for the semiconductor industry.

The successful candidate will be based in the Network Engineering (SNE) Lab of UvA's Informatics Institute. This institute has consistently been ranked among the top 100 computer science departments in the world by various international university rankings. The SNE lab conducts research on leading-edge computer systems of all scales, ranging from global-scale systems and networks to embedded devices. Across these multiple scales our particular interest is on extra-functional properties of computer systems, such as performance, energy consumption, reliability, programmability, productivity, trustability, and security.

Project description

The iDAPT project will focus on run-time monitoring, analyzing, simulating and steering the extra-functional behavior (EFB) of complex, networked real-time computer systems. EFB is a general term that encompasses all the behavior of a computer system not primarily encoded in the source code of its software, like performance, throughput, fault rates, total memory usage, disk I/O, etc. The proposed approach in this project is to model and simulate the system at a high level of abstraction, and perform run-time monitoring and analysis of EFB while the system is operating. These abstract simulation system models will need to be made 'auto-calibrating' (i.e., they are calibrated at run time) and should allow for predicting – using e.g. machine-learning techniques – how the EFB will evolve over time and, if needed, to propose operating-system based countermeasures to control the EFB according to requirements of the system (components). The proposed methodology will provide a breakthrough in EFB management of complex, networked computer systems.

Tasks

The PhD candidate is expected to:

- perform research in the scope of the iDAPT project;
- complete and defend a PhD thesis within the official appointment duration of four years;
- collaborate with other SNE researchers as well as with people from our project partner, ASML;
- regularly present intermediate research results at international conferences and workshops, and publish them in proceedings and journals;
- assist in relevant teaching activities.

Requirements

- M.Sc. in **computer science** or **computer engineering**;
- Preferably some prior expertise in one or more of the following fields: system software and software engineering, modeling and/or simulation, performance analysis, concurrent programming;
- Candidate should be open to industrial cooperation and should be comfortable with working at ASML in Veldhoven for one day per week (dependent on the project phase);
- Fluency in oral and written English is required;
- The candidate is expected to have good programming skills, and able to deliver reusable, self-contained, well-documented software.

More information

Further information can be obtained from Dr. Andy D. Pimentel, Informatics Institute, University of Amsterdam, Science Park 904, 1098 XH, Amsterdam, The Netherlands; tel. +31 20 525 7578; email: a.d.pimentel@uva.nl

No agencies please