PhD position in Machine Learning and Software Engineering

LIG lab, University of Grenoble, France

Title: Enhanced Specification Mining of Workflows through Testing
Duration: 3 years
Starting date: October 2018

Context: Testing Information Systems has become a major bottleneck. Besides the ever-growing complexity of such systems, their indispensable assurance quality requirements have led to increase dramatically the verification and validation costs. Our ambition is to be able to leverage the wealth of data that can be retrieved from execution traces by using advanced machine learning and mining techniques to automate the extraction of functional workflows and automatically derive relevant tests from these workflows. This research will be done in collaboration with University of Sunshine Coast (Australia), Simula lab (Norway), U. of Bourgogne Franche-Comté (France) and 2 industry partners providing data and test automation tooling.

Description: The PhD work will investigate model inference and other machine learning techniques to reverse engineer functional workflows from test execution traces, in the form of enhanced state machine models. It will combine passive inference (from recorded tests) with active inference (deriving new tests to fill the gaps and accelerate the learning process). The main challenges are: combining the various abstraction algorithms that are already available (e.g. clustering, abstraction-learning, and model-inference), and ensuring that the resulting workflows are not too abstract, so that they can still be used to generate feasible test sequences; and that they are easily understandable to be put in the context of the process.

Application: The application should include a brief description of research interests and past experience, a CV, degrees and grades, relevant publications, and any relevant documents. Candidates are encouraged to provide contact information to reference persons. Please send your application in one single pdf to both Christophe.Brouard@univ-grenoble-alpes.fr, Roland.Groz@univ-grenoble-alpes.fr

Working Environment: The PhD candidate will work at LIG in Grenoble, with the AMA and VASCO teams (http://ama.liglab.fr/ , http://vasco.imag.fr/).