Laboratoire d'Analyse et d'Architecture des Systèmes du CNRS

USING FAULT INJECTION TO TEST SOFTWARE ROBUSTNESS

par
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résumé de l'exposé

Testing that a software system meets its functional requirements is a necessary step in the validation process, but is not enough. Determining whether the system can handle errors and failures of its components or in its environment is also important and frequently neglected. Robustness testing, which is aimed at verifying whether a system can function appropriately in the presence of faults and stressful environmental conditions, is thus a necessary complement to system functional testing. Various approaches have been proposed for robustness testing: (i) in a formal testing context, where robustness testing is guided by a model representing the system specification, (ii) experimentally or (iii) using a hybrid approach combining both methods. Experimental approaches are usually based on fault injection, in which faults are deliberately introduced into a system to observe its behavior. We present two hybrid approaches that were used in our projects. One uses the software architecture to guide fault injection to test the robustness of a component-based system. The other also uses fault injection, and robustness test cases are generated based on a behavior specification. We present some results obtained up to now and finish the presentation giving some directions for future work.

l'orateur

Eliane Martins has a PhD in Computer Science by École Nationale Supérieure de l'Aéronautique et de l'Espace (ENSAE) and Laboratoire d'Automatique et d'Analyse des Systèmes (LAAS), Toulouse, France, 1992. She is at the Institute of Computing of the State University of Campinas (Unicamp) since 1993 and in 2001 she became Associate Professor.

Her research interests include conformance and robustness testing of software, especially, communication protocols and embedded systems. For robustness testing purposes, the use of fault injection is the main concern. She is also interested in methods and tools for model-based test case generation.

She is now in a sabbatical year at the Institut National des Télécommunications (INT) at the Department of Software and Networks (LOR), in Evry, France.