SEAMS 2009: Software Engineering for Adaptive and Self-Managing Systems

Betty H.C. Cheng
Michigan State Univ., USA
chengb@cse.msu.edu

Rogério de Lemos
University of Kent, UK
r.delemos@kent.ac.uk

David Garlan
Carnegie Mellon Univ., USA
garlan@cs.cmu.edu

Holger Giese
Hasso Plattner Institute, Germany
holger.giese@hpi.uni-potsdam.de

Marin Litoiu
York University, Canada
mlitoiu@yorku.ca

Jeff Magee
Imperial College, UK
j.magee@ic.ac.uk

Hausi A. Müller
University of Victoria, Canada
hausi@cs.uvic.ca

Richard Taylor
University of California, Irvine, USA
taylor@ics.uci.edu

Abstract

With the rapid growth of web services and the continuous evolution from software-intensive systems to socio-technical ecosystems, the management of modern computing systems with many uncertainties in their environments presents significant challenges and risks for businesses. End-users increasingly demand software systems that are resilient, dependable, fault-tolerant, energy-efficient, or self-healing. One of the most promising approaches to engineering these properties is to equip software systems with feedback control to address the management of inherent system dynamics. The resulting self-adapting and self-managing computing systems are better able to cope with and even accommodate changing contexts and environments, shifting requirements, and computing-on-demand needs.

The SEAMS workshop series consolidates the interests in the software engineering community on self-adaptive and self-managing systems. SEAMS provides a forum for researchers to share new results, raise awareness, and promote collaboration. SEAMS 2009 builds on the success of the SEAMS ICSE workshops of 2008 in Leipzig, Germany, 2007 in Minneapolis, USA, and 2006 in Shanghai, China.

1. Introduction

The goal of this symposium is to bring together researchers and practitioners from many diverse areas to discuss fundamental principles, experiences, and critical challenges of self-adaptive and self-managing systems [1, 2, 3].

Self-adaptive, self-managing and autonomic systems are capable of dealing with a continuously changing environment and emerging requirements that may be unknown at design-time. However, building such systems cost-effectively and in a predictable manner is a formidable engineering challenge. One of the main approaches to manage the effects of this uncertainty and unpredictability is to use feedback loops to orchestrate self-adaptation and self-management. Over the past decade application areas and technologies related to self-adaptation and self-management have grown in importance. It is important to emphasize that in all these initiatives software has become the common element that enables the provision of self-adaptability or self-management. Specifically, SEAMS focuses on the software engineering aspects, including the concepts, methods, techniques, and tools required to support the systematic development and operation of complex software systems featuring dynamic self-adaptive behaviour. The workshop not only focuses on the development, but also the operation of self-adaptive, self-managing or autonomic systems.

SEAMS topics include, but are not limited to: feedback control and architecture patterns for self-adaptation and self-management; models and algorithms for software self-management; decision algorithms for self-adaptive systems; formal notations for modeling and analyzing software self-adaptation; methods for engineering user-trust of self-adaptive and self-managing systems; methods to instrument existing systems to observe self-managing behaviour over long periods of time; dynamical verification and validation of self-managing software; or evaluation and assurance of self-adaptive systems.
2. Progress report

2.1. SEAMS 2008

SEAMS 2008 featured two inspiring keynotes, seventeen excellent papers, a panel discussing a research roadmap, and a fabulous German dinner at Alte Nikolaischule in the beautiful center of Leipzig [3]. The keynote speakers, Jeff Kephart, IBM Research and Robert Baillargeon, General Motors presented problems, solutions, and research challenges for two hot application areas: the management of energy in green data centers and vehicle-to-vehicle and vehicle-to-infrastructure communication in the automotive cyber-physical system. The workshop culminated with a panel on a highly anticipated roadmap paper that grew out of a workshop held in Dagstuhl in January 2008.

2.2. Dagstuhl roadmap paper and book

The roadmap paper is structured around several Dagstuhl working group topics [4]: requirements engineering for self-adaptive and self-managing systems, modelling of a managed system and its environment, engineering strategies for building self-adaptive systems, and run-time validation and verification of evolving system properties. Over the past year, the paper was expanded into a book to characterize the field of software engineering for self-adaptive systems and present selected results, limitations, lessons learned, and challenges.

3. SEAMS 2009 program and proceedings

The core of the SEAMS 2009 program is a set of excellent and stimulating papers published as SEAMS 2009 proceedings with the ICSE 2009 digital proceedings and in the ACM and IEEE Digital Libraries. The International Program Committee listed below accepted 17 out of 35 submitted papers. Each workshop day is anchored by an exciting keynote. To stimulate lively interactions among workshop participants, each paper session is followed by a 30-minute discussion led by one of the organizers. A couple of breakout sessions focus on open problems and research challenges to foster collaboration in the SEAMS community. For more program details please refer to the SEAMS 2009 web site [http://www.seams2009.cs.uvic.ca/].

4. SEAMS 2009 committees

4.1. Organizing committee

General Chair: Hausi A. Müller, University of Victoria, Canada; Program Chair: Jeff Magee, Imperial College, UK; Organizing Committee Members: Betty H.C. Cheng, Michigan State University, USA; Rogério de Lemos, University of Kent, UK; David Garlan, Carnegie Mellon University, USA; Holger Giese, Hasso Plattner Institute, Germany; Marin Litou, York University, Canada; and Richard Taylor, University of California, Irvine, USA.

4.2. Program committee

Nelly Bencomo, Lancaster University, UK; Betty H.C. Cheng, Michigan State University, USA; Rogério de Lemos, University of Kent, UK; Giovanna Di Marzo Serugendo, Birbeck, University of London, UK; Anthony Finkelstein, UCL, UK; Cristina Gacek, University of Newcastle upon Tyne, UK; David Garlan, Carnegie Mellon University, USA; Kurt Geihs, University of Kassel, Germany; Holger Giese, Hasso Plattner Institute, Germany; Ethan Hadar, CA Labs, Israel; Paola Inverardi, University of L’Aquila, Italy; Gail Kaiser, Columbia University, USA; Holger Kienle, University of Victoria, Canada and Germany; Marin Litou, York University, Canada; Jeff Magee, Imperial College, UK; Serge Mankovski, CA Canada Inc.; Pat Martin, Queens University, Canada; Hausi A. Müller, University of Victoria, Canada; John Mylopoulos, University of Toronto, Canada and University of Trento, Italy; Sooyong Park, University of Sogang, South Korea; Anna Perini, FBK-IRST, Trento, Italy; Mauro Pezzé, University of Lugano, Switzerland; Masoud Sadjadi, Florida International University, USA; Mary Shaw, Carnegie Mellon University, USA; Dennis Smith, SEI, USA; Richard Taylor, University of California, Irvine, USA; and Danny Weyns, Katholieke Universiteit Leuven, Belgium.

References


