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Edited by

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Aims and Scope
The Dagstuhl Artifacts Series (DARTS) publishes evaluated research data and artifacts in all areas of computer science. An artifact can be any kind of content related to computer science research, e.g., experimental data, source code, virtual machines containing a complete setup, test suites, or tools.

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Preface

The objective of the International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS) is to bring together researchers and practitioners from diverse areas to investigate, discuss, and examine the fundamental principles, state of the art, critical challenges, and applications of engineering self-adaptive and self-managing systems.

Self-adaptation and self-management are key objectives in many modern and emerging software systems, including the industrial internet of things, cyber-physical systems, cloud computing, and mobile computing. These systems must be able to adapt themselves at run time to preserve and optimize their operation in the presence of uncertain changes in their operating environment, resource variability, new user needs, attacks, intrusions, and faults. Approaches to complement software-based systems with self-managing and self-adaptive capabilities are an important area of research and development, offering solutions that leverage advances in fields such as software architecture, fault-tolerant computing, programming languages, robotics, mixed-initiative systems, and run-time program analysis and verification. Additionally, research in this field is informed by related areas like biologically-inspired computing, artificial intelligence, machine learning, control systems, and agent-based systems. The SEAMS symposium focuses on applying software engineering to these approaches, including methods, techniques, and tools that can be used to support self-* properties like self-adaptation, self-management, self-healing, self-optimization, and self-configuration.

Now in its 12th year, SEAMS has become the focal point for software engineering research in self-adaptive and self-managing systems. This year, the conference has made special emphasis in promoting artifacts that help to provide a common basis for comparison and for further research in the area. Artifacts include model problems and exemplars, publicly available tools, frameworks, and data repositories.

We selected 7 artifact submissions, informed by at least 3 reviews per artifact, followed by a moderated discussion among the artifact evaluation committee (AEC) members who reviewed each artifact. Accepted artifacts include testbeds for prototyping and comparison of self-adaptive solutions in different application areas such as underwater unmanned vehicles, video encoding, IoT, and distributed computing platforms, as well as frameworks for self-adaptation in the context of big data analytics and intelligent ensembles. Moreover, the array of artifacts included in this issue also incorporates a tool for run-time monitoring and verification of self-adaptive systems.

A first category of artifact that includes “Hadoop-Benchmark: Rapid Prototyping and Evaluation of Self-Adaptive Behaviors in Hadoop Clusters”, “Self-Adaptive Video Encoder: Comparison of Multiple Adaptation Strategies Made Simple”, “UNDERSEA: An Exemplar for Engineering Self-Adaptive Unmanned Underwater Vehicles”, and “DeltaIoT: A Real World Exemplar for Self-Adaptive Internet of Things” addresses challenges that concern the difficulty of reproducing experiments in complex settings, lowering the effort required for prototyping, evaluation, and comparison of self-adaptive behavior in different domains.

While the first category of artifact is agnostic with respect to the type of self-adaptation mechanism employed for experimentation, a second category of artifact included in this issue is inclusive of self-adaptation frameworks that facilitate building and evaluating self-adaptation strategies in different contexts: “Intelligent Ensembles – a Declarative Group Description Language and Java Framework” is a framework that includes a language to experiment with group-wise adaptations in smart cyber-physical systems, whereas “Model

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Problem (CrowdNav) and Framework (RTX) for Self-Adaptation Based on Big Data Analytics" targets evaluation of self-adaptation techniques in complex large-scale distributed systems.

Finally, "Lotus@Runtime: A Tool for Runtime Monitoring and Verification of Self-adaptive Systems" complements the other two artifact categories by providing mechanisms that facilitate collection and management of information about the run-time behavior of self-adaptive systems during experimentation.

We hope that the selection of SEAMS 2017 artifacts will serve as a community resource for comparative evaluation of research on self-adaptive systems in the years to come.

Assembling this selection of artifacts would not have been possible without the dedicated effort and expertise of the 10 AEC members, who worked under tight time constraints. Special thanks to them, as well as to all the authors for making their artifacts available to the community.

Javier Cámara, Artifacts Chair of SEAMS 2017
Bashar Nuseibeh, Program Chair of SEAMS 2017
David Garlan, General Chair of SEAMS 2017

Artifact Evaluation Process

In contrast with other venues, in which artifact evaluation is only open to accepted research papers, SEAMS 2017 solicited artifacts in two modalities:

- *Stand-alone modality.* Requires the submission of an artifact paper (up to 6 pages) including a synopsis or description of the problem that is being addressed, a description of the context(s) in which the resource would be useful, a list of the challenges that it poses for self-adaptation, and examples of its use in at least one area of self-adaptive systems. Accepted papers and artifacts will be included in the proceedings, and authors will be given an opportunity to present at SEAMS.
- *Research paper modality.* The artifact complements a long research paper and does not require a separate paper submission. In this modality, the evaluation of the artifact and the review process for the research paper were carried out independently, and the outcome of each of the processes did not affect that of the other.

Every artifact was reviewed by three committee members. Each one of them were given the (artifact or research) paper to read before examining the artifacts. They were then asked to individually submit a detailed review and scoring of the artifact using the following criteria:

- *Insightful*: Does the artifact address/identify a gap in previous work?
- *Timely*: Does the artifact address a problem that is current/pressing?
- *Useful*: Does it serve a useful purpose? Does it serve a purpose that would otherwise be tedious, prolonged, awkward, or impossible?
- *Usable*: Is it easy to understand? Is it accompanied by tutorial notes/videos and other documentation? If the artifact is executable, is it easy to download, install, or execute? Does it include source code? (source code is desirable but not required). Is it available in a virtual machine image? Is it available online? Is it supported by configuration management tools to permit easy updates?

Committee members were encouraged to provide detailed and constructive feedback to the authors, as well as a clear recommendation of acceptance or rejection of the artifact submissions in the following scale: strong reject, reject, weak reject, borderline, weak accept, accept, strong accept. In case of differences in overall assessment between reviewers, they were asked to try to reconcile it among themselves, with the Chair intervening only to manage the discussion and facilitate reaching an agreed decision among all committee members involved.

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