5th ICSE Workshop on Component-Based Software Engineering: Benchmarks for Predictable Assembly

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ABSTRACT
This workshop brings together researchers and practitioners from the community interested in predictable assembly from certifiable components. The goal of this workshop is to ensure continued collaboration among the members of this community. One output of the workshop will be an understanding of composition theory and how it applies to community model problems that were suggested at the workshop on component-based software engineering held at ICSE in 2001. A second output will be the identification of research opportunities that lie on the perimeter of predictable assembly.

Keywords
Certification, component, software architecture, analysis, composition languages, trusted components

1 INTRODUCTION
The critical role of software components in modern business systems is no longer a matter of analyst speculation but rather an accomplished fact. Success of component-based development depends on the ability to predict the quality of component-based systems; however, developers are currently unable to make such predictions. Research is needed to develop a component composition theory for reasoning about both the functional and extra-functional properties of component assemblies based on the properties of components.

Issues related to developing a composition theory include determining what properties are of interest to developers and users of components, how to predict the properties of assemblies, how to measure properties of components, how to verify the measurements, and how to communicate the property values to component users. Resolving these issues requires collaborative work of researchers in several domains including compositional reasoning, composition languages, component trust and certification, software architecture, and software components.

These issues were addressed at 4th ICSE Workshop on Component-Based Software Engineering: Component Certification and System Predication (CBSE4). CBSE4 was the most well-attended workshop at ICSE 2001 and achieved all of its stated goals; the elements of predictable assembly were characterized, community model problems have been developed, and a community has emerged to study problems related to predictable assembly.

The CBSE4 organizers edited a special issue of the Journal of Systems and Software, which is to be published in the Fall of this year, and a workshop summary that appeared in Software Engineering Notes, November 2001. In addition the model problems identified as an outcome of CBSE4 were the focus of a mid-year workshop attended by a core of the program committee. The workshop was held at the Software Engineering Institute in October 2001. The *5th ICSE Workshop on Component-Based Software Engineering: Benchmarks for Predictable Assembly* (CBSE5) is a follow-on workshop in which we hope to further refine community model problems and models of their solutions.

In the previous workshop we recognized that the solution to the problem of predictable assembly is the identification and application of a component composition theory, which

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is based upon both constructive and analytic techniques. In order to achieve understanding of these techniques and to test the feasibility of their use we want to apply them to model problems. This is the primary goal for CBSE5. A composition theory assumes the availability of information about the properties of components but in practice we do not know how to measure and communicate this information. Thus, a second goal for the workshop is to raise issues related to understanding how to provide this information. A third goal for the workshop is to increase the attention of the software engineering community at large to the issues related to predictable assembly.

2 WORKSHOP OBJECTIVES

The two-day workshop will bring together 25-35 researchers and practitioners working in the research domains listed in Section 1. This list expands those targeted by CBSE4 with the addition of researchers interested in composition languages. The program committee is representative of these research domains; composed primarily of people involved with CBSE4, but also includes several new members. We anticipate a lively and provocative workshop.

The concrete objectives for the workshop are to:

1. Achieve better understanding of compositional reasoning techniques and to test the feasibility of their use through their application to community model problems. These model problems, as well as a guide for model solutions, will be made available in the form of a white paper to perspective workshop participants.

2. Explore the perimeter of predictable assembly. Examples of issues that reside in the perimeter are:

   a. pre-requisites for compositional reasoning, i.e. identification and formal specification of properties that convey information about component internals,

   b. measurement techniques for assessing the properties,

   c. methods for certifying these measurements, and

   d. methods for communicating the resulting values.

3. Identify target journals for special issue publication on composition theory and predictable assembly.

3 WORKSHOP ORGANIZATION

A call for papers was posted on the web at http://www.sei.cmu.edu/pacc/CBSE5/ along with supporting documentation. Workshop attendance is by invitation only, based primarily on acceptance of position papers. Accepted papers were posted at the workshop's web site in advance of the workshop, providing a forum for advanced discussion and group development of the workshop agenda. The workshop has two main sessions, held on May 19 and 20; the first devoted to objective 1 and the second devoted to objectives 2 & 3. The workshop activity will mainly take the form of group discussion.

4 WORKSHOP ORGANIZERS

Ivica Crnkovic is professor and head of the Computer Science Laboratory at Mälardalens University. He worked for many years at ABB, where he was responsible for development environments as a project leader and a manager of a development group. His main research interests are software configuration management, component-based development, and general software engineering. He is active in several conferences and workshops as a co-organizer or a PC member.

Heinz Schmidt is Professor for Software Engineering at Monash University where he directs the Centre for Distributed Systems and Software Engineering. He has worked on software specification, environments, and component technology for distributed and parallel systems for over twenty years at the German National Research Centre for Computer Science, the International Computer Science Institute of the UC Berkeley, the Australian CSIRO and Monash University. Dr Schmidt has written books and articles in this area and organized conferences and workshops on objects and software engineering.

Judith Stafford is a senior member of the technical staff at the Software Engineering Institute, Carnegie Mellon University. Dr. Stafford has worked for several years in the area of compositional reasoning and its application to software architectures and component-based systems. She has organized workshops and written widely in these areas.

Kurt Wallnau is a senior member of the technical staff at the Software Engineering Institute (SEI), Carnegie Mellon University. Mr. Wallnau founded the successful series of ICSE component-based software engineering workshops. He has written numerous articles and technical reports on the subject, and is currently leading the SEI's Predictable Assembly from Certifiable Components project.

Other program committee members include:

Jan Bosch, University of Groningen, The Netherlands

Betty Cheng, Michigan State University, USA

Elisabetta Di Nitto, Politecnico di Milano, Italy

Jacky Estublier, LSR-IMAG, France

Kathi Fisler, WPI, USA

Dimitra Giannakopoulou, NASA Ames, USA

Richard Hall, Freie Universität Berlin, Germany

Dick Hamlet, Portland State University, USA

George Heineman, WPI, USA

Shriram Krishnamurthi, Brown University, USA

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Dave Wile, Teknowledge, Corp., USA