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Preface

Real-world systems have evolved into a complex and interconnected combination of networked computer systems and the human operators who use them. Increasingly, national critical infrastructures depend on these complex systems for their continued successful operation. The vision for the future is driving systems to be highly mobile, dynamic, interdependent, recomposable, and reusable. These are desirable features, but they require a higher degree of complexity and automation than past systems. As the complexity of these systems continues to increase, they become less understandable, predictable, and controllable. Addressing these challenges requires the adoption of fundamentally new approaches to building systems that are adaptive, dynamic, and resilient. This book introduces these key issues and their interrelationships and presents new research in support of these areas.

In particular, we start by providing a survey of application fields to show, on the one hand, the requirements of such fields in terms of adaptation and resilience and, on the other hand, to present some successful stories of application of them in real contexts. Then, we will illustrate for readers some techniques that aim at making systems adaptive and resilient, trying to provide a diversified range of approaches from the state of the art. Finally, we will present some topics that do not aim primarily at adaptation and resilience but have some connections and can be fruitfully exploited to increase these features in the systems.

Editors

Niranjan Suri is a research scientist at the Florida Institute for Human & Machine Cognition (IHMC) and also a visiting scientist at the U.S. Army Research Laboratory, Adelphi, Maryland. He received his Ph.D. in computer science from Lancaster University, England, and his M.Sc. and B.Sc. in computer science from the University of West Florida, Pensacola. His current research activity is focused on the notion of agile computing, which supports the opportunistic discovery and exploitation of resources in highly dynamic networked environments. His other research interests include coordination algorithms, distributed systems, networking, communication protocols, virtual machines, and software agents.

Giacomo Cabri received the Laurea degree in computer science engineering from the University of Bologna in July 1995. In February 2000 he received the PhD in information engineering from the Dipartimento di Scienze dell'Ingegneria of the Università di Modena e Reggio Emilia.

He got a research contract by the Dipartimento di Scienze dell'Ingegneria of the Università di Modena e Reggio Emilia, from January 1, 2001, to October 31, 2001. From November 1, 2001, to December 20, 2006, he was a research associate at the Facoltà di Ingegneria of the Università degli studi di Modena e Reggio Emilia, SSD ING-INF/05, position confirmed from November 1, 2004. From December 21, 2006, he is Associate Professor, SSD ING-INF/05 and his affiliation is the Dipartimento di Scienze Fisiche, Informatiche e Matematiche of the Università di Modena e Reggio Emilia.

He teaches different courses in the field of computer science and information technology, both basic ones and advanced ones.

His research activities are mainly related to the following areas:

- Agents: base models and coordination protocols
- Autonomic computing
- Web applications
- Mobile computing

In these areas, he has published around 140 papers in international and national journals and in international and national proceedings and he has received six best paper awards.

He is (and has been) involved in international and national projects.

He is member of several program committees of international conferences; he is and has been chair of several international workshops; and he has been general chair of IEEE WETICE 2004, of ACM PPPJ 2008, and of IEEE WETICE 2014.

For more information, see the web page: <http://www.agentgroup.unimo.it/>

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