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Self-Stabilizing Systems

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Volume Editors

Ted Herman
University of Iowa
Department of Computer Science
Iowa City, IA 52242, USA
E-mail: herman@cs.uiowa.edu

Sébastien Tixeuil
Université Paris-Sud
LRI
Bâtiment 490, 91405 Orsay Cedex, France
E-mail: tixeuil@lri.fr

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Preface

Self-stabilization is an established principle of modern distributed system design. The advantages of systems that self-recover from transient failures, temporary security attacks, and spontaneous reconfiguration are obvious. Less obvious is how the ambitious goal of recovering from the most general case of a transient fault, namely that of an arbitrary initial state, can lead to a simpler system design than dealing with particular cases of failures. In the area of mathematical problem-solving, Pólya gave the term “the inventors paradox” to such situations, where generalizing the problem may simplify the solution. The dramatic growth of distributed systems, peer-to-peer distribution networks, and large grid computing environments confronts designers with serious difficulties of complexity and has motivated the call for systems that self-recover, self-tune, and self-manage. The principles of self-stabilization can be useful for these goals of autonomous system behavior.

The Symposium on Self-Stabilizing Systems (SSS) is the main forum for research in the area of self-stabilization. Previous Workshops on Self-Stabilizing Systems (WSS) were held in 1989, 1995, 1997, 1999, and 2001. The previous Symposium on Self-Stabilizing Systems (SSS) took place in 2003. Thirty-three papers were submitted to SSS 2005 by authors from Europe (16), North America (8), Asia (4), and elsewhere (5). From the submissions, the program committee selected 15 for inclusion in these proceedings. In addition to the presentation of these papers, the symposium event included a poster session with brief presentations of recent work on self-stabilization.

The technical contributions to the symposium this year showed that the area has matured deeply since its first mathematical definition more than thirty years ago. Although there remains a core of four “classical” self-stabilization papers (that close gaps and open problems), the main part of the proceedings is dedicated to either extensions of self-stabilization (six contributions, dealing with snap-stabilization, code stabilization, self-stabilization with either dynamic, faulty or Byzantine components) or to applications of self-stabilization (five contributions, related to operating systems, security, or mobile and *ad hoc* networks).

The symposium of 2005 was one of the events of MANWEEK 2005, which also included the International Conference on Management of Multimedia Networks and Services (MMNS 2005), the International Workshop on IP Operations and Management (IPOM 2005), and the IEEE/IFIP International Workshop on Autonomic Grid Networking and Management (AGNM 2005). The site for the symposium and the other conferences was the Universitat Politècnica de Catalunya, in Barcelona. The SSS 2005 sessions were held on October 26 and 27.

We thank the organizers of MANWEEK 2005, especially Joan Serrat of the Universitat Politècnica de Catalunya, for making local arrangements.

August 2005

Ted Herman
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