Monitoring, Security, and Rescue Techniques in Multiagent Systems

Advances in Soft Computing

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Preface

In todays society the issue of security, understood in the widest context, have become a crucial one. The people of the information age, having instant access to the sources of knowledge and information expect the technology to improve their safety in all respects. That, straightforwardly, leads to the demand for methods, technologies, frameworks and computerized tools which serve this purpose. Nowadays such methods and tools are more and more expected to embed not only ubiquitous information sources, but also the knowledge that stems from them. The use of knowledge-based technology in security applications, and in the society at large, clearly emerges as the next big challenge. Within general set of security-related tasks we may exhale some sub-fields such us monitoring, control, crisis and rescue management.

Multiagent systems are meant to be a toolset for modelling of, automated reasoning with, and study on the behavior of compound environments that involve many perceiving, reasoning and acting parties. In a natural way they are well suited for supporting the research on foundations of automatic reasoning processes starting from data acquisition (including data entry, sensor measurements and multimedia information processing) to automatic knowledge perception, real-life situation assessment, through planning to action execution in the context of monitoring, security, and rescue techniques. These activities are closely related to many very active research areas like autonomous systems, spatio-temporal reasoning, knowledge representation, soft computing with rough, fuzzy and rough mereological approaches, perception, learning, evolution, adaptation, data mining and knowledge discovery, collective intelligence and behavior. All these research directions have plenty of possible applications in the systems that are concerned with assuring security, acting in emergency and crisis situations, monitoring of vital infrastructures, managing cooperative jobs in the situation of danger, and planning of action for the rescue campaigns.

This volume contains extended and improved versions of selected contributions presented at the International Workshop "Monitoring, Security, and Rescue Techniques in Multiagent Systems" (MSRAS 2004) held in Płock, Poland, June 7-9, 2004.

The MSRAS 2004 workshop was aimed at gathering world's leading researchers active in areas related to monitoring, security, and rescue techniques in multiagent

systems. Such techniques are among the core issues that involve very large numbers of heterogeneous agents in the hostile environment. The intention of the workshop was to promote research and development in these significant domains.

The workshop itself was a significant success thanks to the presence and contributions of the leading researchers in the field. In this way, by establishing a forum for exchanging results and experience of top specialists working in areas closely related to such tasks the new possibilities for scientific cooperation have been created. The workshop was also the first step on the road to establishing permanent research and technology center in Płock. We hope that this center, a part of Industrial and Technology Park, will become an important institution contributing to fostering the research in knowledge-based technologies and security.

Organization of the volume

As the 48 contributions in this volume span over very wide area of research, it is quite hard to categorize them precisely. Therefore, there are only two major parts in this volume. First one, entitled "Foundations and Methods" gathers the papers of more theoretical and fundamental character as well as those dealing with general, basic descriptions of various methodologies and paradigms. The second part, entitled "Application Domains and Case Studies" is meant to encapsulate the articles that deal with more specific problems, concrete solutions and application examples. Naturally, the division is very subjective and should not be treated as definite.

Within each part the papers are organized in accordance with they role at the workshop. It means that in each of the parts the articles from keynote presenters come first, followed by invited and regular contributions, and finshed by papers that were part of special and poster sessions.

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Warsaw,
July 2004

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