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Perception and Machine Intelligence

First Indo-Japan Conference, PerMIn 2012
Kolkata, India, January 12-13, 2012
Proceedings

Springer

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Message from the General Chair

Machine intelligence (MI) is a core concept for integrating various advanced technologies with the basic task of pattern recognition and learning. The objective is to give machines the ability to learn, adapt, reason, make decisions, and display behaviors not explicitly programmed into their original capabilities. Intelligent autonomous systems (IAS) is the physical embodiment of machine intelligence. Characteristics to be achieved in the system include: tractability, robustness, flexibility and close resemblance with human-like decision making, among others.

Perception engineering is an integral part of machine intelligence. The concept of perception-based engineering is essentially to integrate the different aspects of the human sensory responses into system and product design.

The First Indo-Japan Conference on Perception and Machine Intelligence (PerMIn 2012) primarily focused on different theoretical, generic and applied research issues of MI and perception engineering. Articles included in the proceedings provide original contributions in MI or perception, using classic as well as modern computing paradigms. Various real-life application areas considered include – speech recognition, image processing, biometrics, cognitive systems, e-nose and e-tongue, behavioral modeling, document processing, remote sensing, data security and bioinformatics. All these, coupled with several keynote and plenary talks by eminent scientists, made this interdisciplinary event an ideal platform to both theoretical and applied researchers as well as practitioners for collaborative research.

I take this opportunity to thank C-DAC, Kolkata, for holding the conference. I hope they will organize similar conferences regularly in successive years. It may be mentioned here that my scientific association with C-DAC, Kolkata, started in the early 1990s when it was called ER&DCI and located in a small unit at Taratala, and the Machine Intelligence Unit (MIU) was just formed at the Indian Statistical Institute, Kolkata. Thanks are due to its two former Executive Directors G.K. Deb and Amiya Baran Saha for their vision, and Rajat Moona, Director General, C-DAC and A.K. Nath, Executive Director, C-DAC, Kolkata, for their continuous support and inspiration. Special thanks to Shri Debasis Mazumder and Soma Mitra for their initiative and co-ordination, and the members of the Organizing, Program and other Committees for their sincere effort in making it a reality. Thanks are also due to all the financial sponsors for their support towards this endeavor, and Springer for publishing the PerMIn 2012 proceedings in their prestigious LNCS series.

November 2011 Sankar K. Pal

Preface

It is our great pleasure to welcome you to the proceedings of the First Indo-Japan Conference on Perception and Machine Intelligence (PerMin 2012), held in Kolkata, India, during January 12–13, 2012. PerMin 2012 was jointly organized by C-DAC, Kolkata, India, in collaboration with the National Institute of Information and Communication Technology, Japan, along with technical support from the Machine Intelligence Unit (MIU), Indian Statistical Institute, Kolkata.

This conference is the first of its kind to be held in Kolkata, the nerve center of the economy and culture of eastern India. The primary motivation behind the conference was to present the state of the art in scientific results, bridging the gap between academia and industry for the purpose of catalyzing collaborative research and development in perception engineering and machine intelligence.

PerMIn 2012 addressed both theories and applications of the different facets of engineering and machine intelligence considering them individually as well as in integration. We hope the conference met the expectations of academicians, researchers, professionals and engineers. We are thankful to the members of the International Program Committee for extending their support in various forms to make a strong technical program. The conference received around 100 submissions from countries across the globe. Each submitted paper was reviewed by at least two referees, and we ultimately selected only 45% of the submitted papers.

We express our gratitude to Jeremy Wolfe, O. Yamaguchi, S. Mukhopadhaya and N.R. Pal, for accepting our invitation to be the keynote and plenary session speakers. We further take the opportunity to express our gratefulness to Rajat Moona, Director General C-DAC and A.K. Nath, Executive Director, C-DAC, Kolkata, for their continuous inspiration behind the scenes.

We would like to express our sincere thanks to the members of the Organizing Committee for their whole-hearted support. Special mention must be made of the Organizing Chair S. Mitra, Finance Chair Nabarun Bhattacharya, and the joint conveners of the Organizing Committee C. Saha and Sri. A. Das. I. Dutta of the Machine Intelligence Unit of ISI Kolkata did a great job and we express our sincere thanks to him.

We gratefully acknowledge the financial support provided by different organizations as listed here. Without their support it would have been impossible to hold this conference. Last but surely not least, we thank Alfred Hofmann, Springer, Heidelberg, for extending his cooperation in publishing the PerMI 2012 proceedings. Finally, we would like to thank all the contributors for their enthusiastic response.

November 2011

Malay K. Kundu
Sushmita Mitra
Debasis Mazumdar
Sankar K. Pal

Organization

PerMIn 2012 was organized by the Centre for Development of Advanced Computing (C-DAC), Kolkata, and in collaboration with the National Institute of Information and Communication Technology (NICT), Japan, and in technical collaboration with the Indian Statistical Institute (ISI), Kolkata.

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