Welcome from the General Co-chairs

We are very pleased to once again welcome our colleagues to the Fifth International Conference on Hybrid Intelligent Systems (HIS'05) at Rio de Janeiro, Brazil during November 06-09, 2005. The HIS series of conferences attracts a wide range of interests with the development of the next generation of intelligent systems and its various practical applications. A fundamental stimulus to the investigation of hybrid intelligent systems is the awareness in the academic communities that combined approaches will be necessary if the real challenges in artificial intelligence are to be solved. Current research interests in this field focus on integration of the different computing paradigms such as fuzzy logic, neuro-computation, evolutionary computation, probabilistic computing, intelligent agents, machine learning, and other intelligent computing frameworks. The phenomenal growth of hybrid intelligent systems and related topics has created the need for this International conference as a venue to present the latest research. HIS'05 builds on the success of last year's. HIS'04, which was held in Kitakyushu, Japan, 05-08, December 2004, attracted participants from over 26 countries. As evident from the general philosophy of HIS conferences, we have a focus on interdisciplinary approaches and the global strategy to bring together research scientists from the various disciplines related to hybrid intelligent systems. HIS'05, the Fifth International Conference on Hybrid Intelligent Systems addresses the following important themes:

❖ Theoretical advances in hybrid intelligent system architectures
- Interactions between neural networks and fuzzy inference systems
- Hybrid learning techniques (supervised/unsupervised/reinforcement learning)
- Artificial neural network optimization using global optimization techniques
- Fuzzy inference system optimization using global optimization algorithms
- Hybrid systems involving support vector machines, rough sets, Bayesian networks, probabilistic reasoning, minimum message length, etc.
- Hybrid computing using neural networks - fuzzy systems - evolutionary algorithms
- Hybrid optimization techniques (evolutionary algorithms, simulated annealing, tabu search etc.)
- Hybrid of soft computing and statistical learning techniques
- Integration with Intelligent agents (architectures, environments, adaptation/learning and knowledge management)
- Hybrid models using inductive logic programming, logic synthesis, grammatical inference, case-based reasoning etc.

❖ Hybrid approaches and applications

- Biomimetic applications
- Bioinformatics
- Robotics and automation
- Web intelligence
- Image and signal processing
- Data mining
- Behavioral simulations
- Affective computing

- Control and automation
- Multi-agent systems
- Knowledge management
- Communication and networking
- Business systems and financial engineering.
- Power engineering

HIS'05 is technically co-sponsored by IEEE Systems Man and Cybernetics Society, International Fuzzy Systems Association, The World Federation on Soft Computing, European Neural Network Society (ENNS), European Society for Fuzzy Logic and Technology (EUSFLAT), Brazilian Computing Society (SBC), Brazilian Society for Automation (SBA) and is organized in cooperation with the IEEE Computational Intelligence Society.

The HIS'05 program committee represented 22 countries on 5 continents and received over 170 full paper submissions. This certainly attests to the widespread, international importance of the theme of the conference. We would like to thank the HIS'05 international program committee and the additional reviewers for providing the reviews in time. Our special thanks also go to all the plenary speakers for providing the very interesting and informed talks to catalyze subsequent discussions.

Our special thanks to Ms. Jeniferdawn Cantarella of IEEE Computer Society Press for all the support and help related to the production of this important scientific work. Finally, we would like to express our sincere gratitude to all the authors and local organizing committees that have contributed towards the success of this conference. We look forward to seeing you in Rio de Janeiro, Brazil, during HIS'05.

General Co-chairs

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Welcome from the Program Co-chairs

HIS 2005 is the Fifth International Conference on Hybrid Intelligent Systems, bringing together researchers from around the world to present their work and promoting a discussion forum for key issues in hybrid intelligent systems. HIS 2005 fosters international collaboration, contributing to the advance of the state of the art in the field.

This year's edition of the conference covers a broad spectrum of topics that include:

- Hybrid Intelligent System Architectures
- Evolutionary Computation
- Fuzzy Systems
- Neural Networks
- Machine Learning
- Statistical Learning
- Heuristics
- Optimization

- Multi-objective Optimization
- Features, Classification and Clustering
- Support vector machines and kernel methods
- Image and signal processing
- Data mining
- Control and Automation
- Multi-agent systems
- Business systems and financial engineering

HIS 2005 received about 170 submissions from 31 countries around the world, which went through a rigorous and tough review process. All papers were refereed by at least three independent referees and, in some uncertain cases the number of referees was up to four. Based on the referee's reports, the Program Committee selected about 80 papers for long presentation and 20 papers for short presentation.

The plenary talks are very topical and are presented by outstanding experts from the area. We believe all participants will enjoy and benefit from them. The tutorials will be delivered by researchers and each will be a half-day long. It is certain that these tutorials will be very useful to students, practitioners and other researchers, as well.

It is a privilege and honour for us to chair the HIS 2005 Program Committee. It has been also a rewarding experience and we express our sincere thanks to all the Program Committee members for their cooperation in the refereeing process. We highly appreciate the hard work and timely feedback of the referees, who did an excellent job. Last but not least, we would like to thank all the authors for their interest in HIS 2005. Thank you for your time and effort in preparing and submitting your papers and your patience through the long process. Your work is the backbone of the conference.

We wish you all a pleasant and fruitful meeting in Brazil.

Program Co chairs

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