

# **Lecture Notes in Networks and Systems**

Volume 14

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D.S. Guru · T. Vasudev · H.K. Chethan  
Y.H. Sharath Kumar  
Editors

# Proceedings of International Conference on Cognition and Recognition

ICCR 2016

 Springer

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## Invited Talks



Prof. A.G. Ramakrishnan  
Indian Institute of Science, Bangalore

**Topic:** Pattern Recognition: A Linear Algebraic Approach



Dr. C. Chandra Sekhar  
IIT, Madras

**Topic:** Image Classification and Retrieval using Kernel Methods



Dr. Dinesh M.S.  
Principal Scientist, Philips  
**Topic:** Medical Image Processing

# Preface

We write this Message with a deep satisfaction to the proceedings of the “International Conference on Cognition and Recognition (ICCR 2016)” held in MIT, Mysore, during December 30–31, 2016, which has the central theme “Image Processing and its Application.” Our research experiences in related areas for the last decade have inspired us to conduct the ICCR 2016. This conference was planned to provide a platform for researchers both from academia and industries where they can discuss and exchange their research thoughts to have better future research plans, particularly in the field of image processing and pattern recognition. Soon after we notified a call for original research papers, there has been a tremendous response from the researchers. There were 120 papers submitted, out of which, we could accommodate only 36 papers based on the reports of the reviewers. Each paper was reviewed by at least two experts from the related areas. The overall acceptance rate is about 30%. The conference is aimed at image processing, signal processing, pattern recognition, document processing, biomedical processing, computer vision, biometrics, data mining and knowledge discovery, information retrieval, and information coding. For all these areas, we got a number of papers reflecting their right combinations. I hope that the readers will appreciate and enjoy the papers published in this proceeding. We could make this conference a successful one, though it was launched with a relatively short notice. It was because of the good response from the research community and the good effort put in by the reviewers to support us with timely reviews. The authors of all the papers submitted deserve my acknowledgments. The proceedings are published and indexed by Springer-LNNE, which is known for bringing out this type of proceeding. Special thanks to them.

We would also like to thank Easy Chair in the submission, review, and proceedings creation processes. We are very pleased to express our sincere thanks to Springer, especially Kamiya Khatter, Aninda Bose, and the editorial staff, for their support in publishing the proceedings of ICCR 2016.

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# About MIT Mysore

MIT is situated at a beautiful, enchanting, and sprawling landscape about three kilometers behind K.R. Mills. The institute is founded by a group of eminent people recognized for their eminence in the field of science and engineering technology. Many of them have served at the highest levels of AICTE and university.

The college is equipped with all modern learning aids to make teaching–learning process a pleasure. The highly qualified staff is its asset.

The college has to its credit the highest number of admissions in the academic year 2007–08 among the 16 newly opened engineering colleges in Karnataka. Our first batch students brought laurels to the college by coming out in flying colors in the first semester examinations conducted by VTU, Belgaum. They captured the sixteenth position among the 135 engineering colleges in the state.

If you are interested in a quality, Maharaja Institute of Technology is the place for you. MIT is a career-focused college that will provide you with a comprehensive educational experience in a variety of growing areas of employment.

# Message



I am pleased to convey my warm greetings to all the participants of the International Conference on Cognition and Recognition “ICCR-2016” organized by Departments of CSE and ISE, MIT, Mysore. I congratulate Departments of CSE and ISE for hosting its Fifth International Conference on “ICCR-2016” during December 30–31, 2016. I learned that many technocrats, educationalists, and academic personnel from national level and international level involved in technical education to congregate and exchange their experiences in the respective domain. This conference brings together academic luminaries and I am delighted such a significant event is happening in the precincts of MIT institutions. I wish the organizing committee of Departments of CSE and ISE the very best in their endeavor. I eagerly look forward to meet all the delegates and speakers from various parts of the country and world during this conference.

Thank you and wish the conference a grand success.

Dr. S. Muruli  
President  
Maharaja Education Trust



I am Delighted to note that CSE and ISE departments of MIT, Mysore, are organizing the International Conference on Cognition and Recognition “ICCR-2016” during December 2016. It is learnt that more than 120 papers have been received across the world. Approximately 30% of papers have been accepted by reviewers for presentation. All the staff members of CSE and ISE departments have been working hard for months together toward the success of this conference. I sincerely convey my heartfelt congratulations to all the faculty members, both teaching as well as non-teaching who have put efforts for this event. I hope that all local as well as foreign delegates will have useful deliberations during the conference. I further, wish their stay at Maharaja Institute of Technology is joyful and useful.

Dr. T. Vasudev  
Secretary  
Maharaja Education Trust



I write this Message with a deep satisfaction to the proceedings of the “International Conference on Cognition and Recognition—ICCR2016” held in MIT, Mysore, during December 30–31, 2016, which has the central theme “Image Processing and its Application.” Our research experiences in related areas for the last decade have inspired us to conduct the ICCR 2016. I feel, I am honored having served as the General chair for the “International Conference on Cognition and Recognition—ICCR2016.” This conference was planned to provide a platform for researchers

both from academia and industries where they can discuss and exchange their research thoughts to have better future research plans, particularly in the field of image processing and pattern recognition. Soon after we notified a call for original research papers, there has been a tremendous response from the researchers. There were 120 papers submitted, out of which, we could accommodate only 50 papers based on the reports of the reviewers. Each paper was blindly reviewed by at least two experts from the related areas. The overall acceptance rate is about 30%. The conference is aimed at: image processing, signal processing, pattern recognition, document processing, biomedical processing, computer vision, biometrics, data mining and knowledge discovery, information retrieval, and information coding. For all these areas, we got a number of papers reflecting their right combinations. I hope that the readers will appreciate and enjoy the papers published in this proceeding. We could make this conference a successful one, though it was launched with a relatively short notice. It was because of the good response from the research community and the good effort put in by the reviewers to support us with timely reviews. The authors of all the papers submitted deserve my acknowledgment. The proceedings are published and indexed by Springer-LNNE, which is known for bringing out this type of proceeding. Special thanks to them. The proceedings will be available globally from 2 months after this conference.

Dr. D.S. Guru  
General Chair, ICCR-2016



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local as well as foreign delegates will have useful deliberations during the conference. I further, wish their stay at Maharaja Institute of Technology is joyful and useful.

Dr. B.G. Naresh Kumar  
Organizing Chair, ICCR-2016