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Progress in Intelligent Computing Techniques: Theory, Practice, and Applications

Proceedings of ICACNI 2016, Volume 1

Springer

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Foreword

Message from the Honorary General Chair Prof. Mike Hinchey

Welcome to the 4th International Conference on Advanced Computing, Networking and Informatics. The conference is hosted at the Centre for Computer Vision and Pattern Recognition, NIT Rourkela, Odisha, India. For this fourth event, held September 22–24, 2016, the theme is Computer Vision and Pattern Recognition.

Following the great success of the last three years, we are very glad to recognize the co-organization of the Center for Computer Vision and Pattern Recognition, at National Institute of Technology Rourkela, India; the Faculty of Engineering and Technology, Liverpool John Moores University, UK; the College of Engineering, Mathematics and Physical Sciences, University of Exeter, UK; and the Faculty of Science, Liverpool Hope University, UI.

Having selected 114 articles from more than 500 submissions, we are glad to have the proceedings of the conference published in the *Advances in Intelligent Systems and Computing* series of Springer.

I am very pleased to have published the special issues of papers from ICACNI in *Innovations in Systems and Software Engineering*: *A NASA Journal*, published by Springer and of which I am editor-in-chief, in each of the preceding years, and all of which were truly excellent and well received by our subscribers.

The accepted papers this year will be considered again for this journal and for several other special issues.

I would like to acknowledge the special contribution of Prof. Sunil Kumar Sarangi, Former Director of NIT Rourkela, as the chief patron for this conference.

The conference is technically co-sponsored by the following professional organizations/laboratories:

1. Joint Control Systems Society and Instrumentation and Measurement Society Chapter, IEEE Kolkata Section
2. IEEE Communications Society Calcutta Chapter
3. Aerospace Electronics and Systems Division, CSIR National Aerospace Laboratories, Govt. of India

4. Dependable Computing and Networking Laboratory, Iowa State University, USA
5. Multimedia Content Security Innovative Research Group, Henan University of Science and Technology, China
6. Poznan University of Technology Vision Laboratory, Poland

We are grateful to all of them for their co-sponsorship and support. The diversity of countries involved indicates the broad support that ICACNI 2016 has received. A number of important awards will be distributed at this year's event, including Best Paper Awards from ACM Kolkata Chapter, a Best Student Paper Award from IEEE ComSoc Koltaka Chapter, a Student Travel Award from INNS, and a Distinguished Women Researcher Award.

I would like to thank all of the authors, contributors, reviewers, and PC members for their hard work. I would especially like to thank our esteemed keynote speakers and tutorial presenters. They are all highly accomplished researchers and practitioners, and we are very grateful for their time and participation.

But the success of this event is truly down to the local organizers, local supporters, and various chairs who have done so much work to make this a great event. We hope you will gain much from ICACNI 2016 and will plan to submit to and participate in ICACNI 2017.

Best wishes,

Professor Mike Hinchey

ICACNI 2016 Honorary General Chair
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Director, Lero-the Irish Software Engineering Research Centre (www.lero.ie)
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Preface

It is indeed a pleasure to receive overwhelming response from academicians and researchers of premier institutes and organizations of the country and abroad for participating in the 4th International Conference on Advanced Computing, Networking, and Informatics (ICACNI 2016), which makes our endeavor successful. The conference organized by Centre for Computer Vision and Pattern Recognition, National Institute of Technology Rourkela, India, during September 22–24, 2016, certainly marks a success toward bringing researchers, academicians, and practitioners in the same platform. We have received more than 550 articles and very stringently have selected through peer review 114 best articles for presentation and publication. We could not accommodate many promising works as we tried to ensure the highest quality. We are thankful to have the advice of dedicated academicians and experts from industry and the eminent academicians involved in providing technical co-sponsorship to organize the conference in good shape. We thank all people participating and submitting their works and having continued interest in our conference for the fourth year. The articles presented in the two volumes of the proceedings discuss the cutting-edge technologies and recent advances in the domain of the conference. The extended versions of selected works would be re-reviewed for publication in reputed journals.

We conclude with our heartiest thanks to everyone associated with the conference and seeking their support to organize the 5th ICACNI 2017 at National Institute of Technology Goa during June 01–03, 2017.

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About the Editors

Dr. Pankaj Kumar Sa received the Ph.D. degree in Computer Science in 2010. He is currently working as assistant professor in the Department of Computer Science and Engineering, National Institute of Technology Rourkela, India. His research interests include computer vision, biometrics, visual surveillance, and robotic perception. He has co-authored a number of research articles in various journals, conferences, and books. He has co-investigated some research and development projects that are funded by SERB, DRDOPXE, DeitY, and ISRO. He has received several prestigious awards and honors for his excellence in academics and research. Apart from research and teaching, he conceptualizes and engineers the process of institutional automation.

Dr. Manmath Narayan Sahoo is an assistant professor in Computer Science and Engineering Department at National Institute of Technology Rourkela, Rourkela, India. His research interest areas are fault tolerant systems, operating systems, distributed computing, and networking. He is the member of IEEE, Computer Society of India and The Institutions of Engineers, India. He has published several papers in national and international journals.

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Dr. Yulei Wu is a lecturer in Computer Science at the University of Exeter. He received his Ph.D. degree in Computing and Mathematics and B.Sc. degree in Computer Science from the University of Bradford, UK, in 2010 and 2006, respectively. His recent research focuses on future network architecture and protocols, wireless networks and mobile computing, cloud computing, and performance modelling and analysis. He has published over 30 research papers on these areas in prestigious international journals, including IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Transactions on Vehicular Technology, and ACM Transactions on Embedded Computing Systems, and reputable international conferences. He was the recipient of the Best Paper Awards from IEEE CSE 2009 and ICAC 2008 conferences. He has served as the guest editor for many international journals, including Elsevier Computer Networks and ACM/Springer Mobile Networks and Applications (MONET). He has been the chair and vice chair of 20 international conferences/workshops and has served as the PC member of more than 60 professional conferences/workshops. He was awarded the Outstanding Leadership Awards from IEEE ISPA 2013 and TrustCom 2012, and the Outstanding Service Awards from IEEE HPCC 2012, CIT 2010, and ScalCom 2010. His research interest areas are Future Internet Architecture: software-defined networking, network functions virtualization, clean-slate post-IP network technologies (e.g., information-centric networking), cloud computing technologies, mobility; Wireless Networks and Mobile Computing; Cloud Computing; Performance Modelling and Analysis.

Dr. Banshidhar Majhi is a professor in Computer Science and Engineering Department at National Institute of Technology Rourkela, Rourkela, India. Dr. Majhi has 24 years of teaching and 3 years of industry experience. He has supervised eight Ph.D. students, 40 M.Tech, and 70 B.Tech students, and several others are pursuing their courses under his guidance. He has over 50 publications in journals and 70 publications in conference proceedings of national and international repute. He was awarded Gold Medal for Best Engineering Paper from IETE in 2001, and from Orissa Engineering Congress in 2000. He visited Department of Computer Engineering, King Khalid University, Abha, Kingdom of Saudi Arabia, as a professor from October 2010 to February 2011 and Department of Computer Engineering and Information Technology, Al-Hussein Bin Talal University, Ma'an, Jordan, as assistant professor from October 2004 to June 2005. His research interests are image processing, data compression, security protocols, parallel computing, soft computing, and biometrics.