
IITK Directions

Volume 4

Editor-in-Chief

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IITK Directions is an institutional series of the Indian Institute of Technology Kanpur. IITK Directions aims at presenting original contributions and reviews of important and cutting-edge topics by the faculty members and other stakeholders of IIT Kanpur in a consolidated manner. It is a platform that reflects upon the ongoing research and development activities, major achievements, and evolving trends. Each volume in the series focuses on a particular area of science and technology with chapters written by the faculty members, students and research staff. Each chapter is written in a journalistic tone for the peer group – readability and accessibility being important parameters. The volumes contain a survey of the subject as a whole and the extent of contributions recorded by the Institute faculty and students who participate so extensively in research.

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Editors

Cyber Security in India

Education, Research and Training

 Springer

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Series Editor's Preface

I am quite pleased about this special issue of Directions which has focused on research & development in the areas of cybersecurity and related technologies. At this point, I would also like to explain the genesis of the current issue.

An “Interdisciplinary Center for Cybersecurity and Cyber Defense of Critical Infrastructures (C3I Center)” was established in 2016 at IIT Kanpur with funding from the Science and Engineering Research Board (SERB), and other funding agencies. The objective of this interdisciplinary center is to build India’s first industry-scale cybersecurity testbed and to carry out research on smart grid security, manufacturing, and other industrial control system security network. This issue, therefore, will highlight the work carried out at IIT Kanpur in this direction, and would also provide some perspectives from other Indian institutes on the research work on cybersecurity is being initiated. Overall, we intended to provide a collection of articles as a snapshot of the R&D efforts in the cybersecurity field which we believe will be of use to academic institutions as well as government agencies. We will be immensely satisfied if this endeavor can initiate new collaborations, both academic and industrial, in the near future.

I am thankful to the authors for their spontaneous participation to contribute these articles and make timely revisions based on editors’ notes. I am also thankful to the editors and the publication team for raising the quality of the publication. It is worthwhile to note that this is the third issue of Directions which is published by Springer. Based on our experience with the earlier issues, we expect to achieve a wider circulation for this issue as well, and surely the quality of the two-stage editing process will be appreciated by the readers.

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About the Editors

Sandeep Kumar Shukla is currently the Poonam and Prabhu Goel Chair Professor and Head of the Computer Science and Engineering Department, Indian Institute of Technology, Kanpur, India. He is the Editor-in-Chief of ACM Transactions on Embedded Systems and an Associate Editor of ACM Transactions on Cyber-Physical Systems. He is an IEEE fellow, an ACM Distinguished Scientist, and served as an IEEE Computer Society Distinguished Visitor from 2008 to 2012, and as an ACM Distinguished Speaker from 2007 to 2014. He was previously an Associate Editor of IEEE Transactions on Computers, IEEE Transactions on Industrial Informatics, IEEE Design & Test, IEEE Embedded Systems Letters, and various other journals. He was a member of the faculty at the Virginia Polytechnic Institute, Arlington, Virginia, between 2002 and 2015, and has also been a visiting scholar at INRIA, France, and the University of Kaiserslautern, Germany. In 2014, he was named a fellow of the Institute of Electrical and Electronics Engineers (IEEE) for his contributions to applied probabilistic model checking for system design. He has authored several books on systems and has edited and co-authored numerous books with Springer.

Prof. Manindra Agrawal received his B.Tech. and Ph.D. in Computer Science and Engineering from the Indian Institute of Technology, Kanpur in 1986 and 1991, respectively. He was a fellow of the School of Mathematics, SPIC Science Foundation, Chennai, from 1993 to 1995, and a Humboldt fellow at the University of Ulm, Germany, from 1995 to 1996. He joined the faculty at IIT Kanpur as an Assistant Professor at the Department of Computer Science and Engineering in 1996. And was appointed as the N. Rama Rao Chair Professor in 2003. He is the recipient of several international awards, including the Fulkerson Prize 2006 and the Gödel Prize 2006, and has published and presented papers in respected journals. He was the Head of the Computer Science and Engineering Department, and Dean of Faculty affairs at IIT Kanpur. Currently, he is the Deputy Director and Officiating Director of IIT Kanpur. Prof. Agrawal has made significant contributions to the theory of efficient reductions between computational problems, which are part of the program studying the wellknown P vs NP question in mathematics/computer science. His joint paper with two of his former students resolves the centuries-old problem of a fast test of primality. In the language of complexity theory, they have proved that recognizing primes is in the ‘class P’ and this constitutes one of the most striking problems now known in this class.

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