

Preface

I take this opportunity to welcome you all to the Proceedings of the 15th INDIACom; 2021 08th International Conference on “Computing for Sustainable Global Development”; INDIACom – 2021; the fifteenth edition of the annual series; being organized during 17th – 19th March, 2021.

Throughout the world, nations have started recognizing that IT is now acting as a catalyst in speeding up the economic activities in efficient governance, citizens’ empowerment and in improving the quality of human life. Recent developments in IT have touched almost every conceivable area of human life. Emergence of Information and Communication Technologies (ICT) on the national agenda, witnesses the impact of IT on good governance, sustainable development, globalization of economy and social empowerment. In light of this, the theme, Computing for Sustainable Global Development, is very much relevant and timely, even now.

The objective was to bring the eminent academicians, scientists, researchers, industrialists, technocrats, government representatives, social visionaries and experts from all strata of society, under one roof, to explore the new horizons of innovative technologies to identify opportunities and define the path forward. This new path should eliminate isolation, discourage redundant efforts and promote scientific progress aimed to accelerate India’s overall growth to prominence on the International front and contribute effectively to realize and achieve the country’s mission of being a Developed Nation. The conference will feature regular paper presentation sessions, invited talks, key note addresses, panel discussions and poster exhibitions.

Encouraged by the resounding success of past fourteen editions of INDIACom(s) since its inception in 2007 with INDIACom – 2007; INDIACom - 2021 was announced as the 15th edition of the annual series at international level under technical sponsorship of IEEE Delhi Section with permission to submit, for possible publication and indexing, all accepted papers, which will be presented during the conference, in IEEE Xplore. It attracted researchers and practitioners from academia, industry and government agencies, in order to exchange ideas and share their valuable experiences. Over 1000 papers authored by over 2900 authors, from all over of the world, were received; till the last date; thereby making the job of the Technical Programme Committee (TPC) extremely difficult. Based upon an initial scrutiny, 706 papers were found worth consideration for detailed technical review. After a series of tough review exercises, by a team of over 600 experts, 190 papers, authored by over 400 authors from different parts of the country and abroad, were recommended to be accepted for presentation in INDIACom – 2021 during the three days under different parallel tracks. These 190 papers have been published in the soft copy of the Pre-Conference Proceedings having ISBN 978-93-80544-41-0 serial and IEEE Part No. CFP2183W-DVD. Out of these 190 papers, 168 papers were presented during the conference. The proceedings of these 168 papers having ISBN 978-93-80544-43-4 serial and IEEE Part No. CFP2183W-ART are submitted herewith to the IEEE Xplore for publication and indexing. These papers represent wide variety of research topics in all the emerging areas besides traditional and core computational areas. Some of the application oriented papers may not be very rich in technical content, but provide extensive information about the new areas where computing can really be useful for the overall prosperity of the mankind, which in turn might facilitate the overall growth in the country. I am sure, these contributions will definitely enrich our knowledge

and motivate many of us to take up these challenging application areas and contribute effectively for the Sustainable Global Development.

At this point of time, I would like to thank our Hon' ble Founder – Bharati Vidyapeeth, Dr. Patangraoji Kadam, who will always remain a constant source of inspiration for the young generation, for having given me this noble opportunity at Bharati Vidyapeeth, New Delhi. I would also like to thank Hon' ble Prof. (Dr.) Shivajiraoji Kadam, Chancellor, Bharati Vidyapeeth Deemed to be University, Pune, and Hon' ble Dr. Vishwajit Kadam, Secretary, Bharati Vidyapeeth, Pune, for giving me all encouragements, support and a path aimed to quality and excellence, comparable to the best in the world.

We are grateful to a number of people without whom we would not have been able to successfully organize this mega event. I am personally thankful to Professor Mohammad Yamin, Adjunct, Research School of Computer Science, The Australian National University, Canberra (Australia) and his team of experts, including Dr. Abdullah Basahel at King Abdulaziz University, Jeddah (KSA) for having collaborated with us and organized their prestigious 7th International Workshop on Information Engineering and Management (IWIEM – 2021) with INDIACom-2021 at New Delhi, consecutively 06th time, which certainly adds value to the conference. On behalf of the Organizing Committee, I thank to my esteemed authors for having shown confidence in us and considered INDIACom – 2021, a platform to showcase and share their original research work. I wish to express my gratitude to my focused and dedicated team of Chairs, Co-chairs, members of the International Advisory Committee, Technical Programme Committee (TPC), Local Organizing Committee, Web Administration and Content Development Committee, members of the Executive Committee of IEEE Delhi Section, members of IEEE Delhi Section Standing Committee on Technical and Professional Activities, members of IEEE Oversight Committee for this conference, members of the National Executive Committee of CSI, members of the Executive Committee of IETE Delhi Centre, members of Executive Committee of IITP, Delhi, members of the Management Committee of ISTE Delhi Section, officials of GGSIP University, New Delhi, my team of teaching and non-teaching staff members and finally my students for being a great source of strength to me in making this event successful. I consider myself to be fortunate to have such a dedicated and ever supporting team. A very special thanks to Dr. Ritika Wason, Dr. Vaishali Joshi, Mr. Manish Kumar, Mr. Uttam Singh Bisht and Dr. Sunil Pratap Singh for having worked relentlessly to make this conference successful and also easing out the compilation process of this huge and voluminous Proceedings. The automated Conference Management System (CMS), which certainly has proved to be a successful interface for this conference, year after year, is also an out come of the hard work of our own team of students supervised by the Faculty Incharge; Mrs. Shalini Singh Jaspal and Mr. Uttam Singh Bisht.

I will fail in my duty, if I do not thank the Conveners - cum – Session Chairmen of all the Special Sessions, who undertook the challenge and worked so hard along with their team members that over 400 papers were received for Special Sessions alone, thereby making it a milestone conference of the country, in which over 100 organizations, from across the country and abroad, were the co-organizers. My heartfelt appreciation to each one of them, for coming forward, so actively, taking ownership and together making this conference a great success. With

these great associations and extended ownership, I am confident that, in the years to come, future editions of INDIACom will achieve a much greater and unparalleled heights.

I am personally thankful to Prof. Subrata Mukhopadhyay, Chairman, IEEE Delhi Section Standing Committee on Technical and Professional Activities; Prof. A. K. Saini, Conference Chair, for having offered their technical support and helped me at all the difficult and critical times in the process of making this Conference a great success.

I also take this opportunity to thank various organizations, which have sponsored and collaborated with us in organizing this conference and meeting the financial constraints, especially to GGSIP University, New Delhi, SERB, Department of Science and Technology, Ministry of Science and Technology, Government of India, Council of Scientific and Industrial Research (CSIR), New Delhi, All India Council for Technical Education (AICTE), New Delhi, Institutions of Electronics and Telecommunication Engineers (IETE), Delhi Centre and Jagdishprasad Jhabarmal Tibrewala University, Jhunjhunu, Rajasthan. I am also thankful to my printer Mr. Naresh, for patiently incorporating all the changes, as suggested from time to time, irrespective of the frequency and the repeated efforts.

Those who have organized conferences of this magnitude, edited and compiled such voluminous Pre-Conference Proceedings, know the amount of time and effort that goes into such a project. Any one who is related to the editor can tell you at whose expense that time was spent. Mere thanks to Roohi, Faisal and Nargis seem small as compared to the tremendous support and indulgence they gave and tolerated me all along, while I devoted my time in planning the Conference, editing and compiling the Proceedings.

Finally, I am thankful to one and all, who have contributed directly or indirectly in making this conference successful.

Tremendous amount of efforts put in to compile this huge and voluminous Proceedings will be successful only if these papers could motivate some of us in taking up the major computing challenges for a huge country like India, in the coming years.

Last but not the least, I take this opportunity to give the credit of successfully bringing out this Proceedings to my team, one and all, specially to Mr. Manish Kumar, Dr. Vaishali Joshi and Dr. Sunil Pratap Singh, and personally own the responsibility of all the errors, deficiencies and shortcomings. As the available time was very short, in spite of our best efforts to produce a quality publication with a consistent format, errors may remain. My apologies to our readers and contributors for that and request them to kindly send / e-mail their criticism and suggestions, which will be vital for the improvement of the post conference further edited version of the Proceedings.

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