July 22 – 23, 2020

PROCEEDING OF

ICONISE 2020

Proceeding of
International Conference on Industrial and System Engineering (IConISE) and Annual Conference on Industrial and System Engineering (ACISE) 2020

Preface

On behalf of the organizing committee, it is our delighted pleasure to welcome all participants to **the Joint International Conference of the 2nd International Conference on Industrial and System Engineering (IConISE) and the 7th Annual Conference on Industrial and System Engineering (ACISE)**. IConISE is a biannual international conference organized by Industrial and Systems Engineering Department of Institut Teknologi Sepuluh Nopember, Surabaya. At the same time, ACISE is an international conference which has been conducted annually by the Industrial Engineering Department of Diponegoro University.

The theme of this joint conference is "***Big Data Analytics: A competitive Tools toward Smart Industrial System***". As may all of us realize, in the last decade, industries experienced a massive shift towards digitalization. As the benefit of the digitalization, a vast amount of data could be collected almost effortlessly throughout the operational activities within companies and organizations. Due to the advancing information technologies, a company or organization also can access a huge amount of external data. The internal and external big data can be capitalized further to improve the effectiveness and efficiency of the industrial systems or in another word, make the industrial systems smarter.

This fascinating forum is dedicated to discussing the role and issues of big data analytics in every significant aspect of the industrial system. The joint organizing committee has received over 200 submissions from Indonesia, Malaysia, Italy, Philippines, Taiwan, United Kingdom and Japan. After the double-blind review process, 149 papers are accepted and scheduled to be presented and discussed in the parallel session, then published in IOP Conference Series: Materials Science and Engineering, a Scopus-indexed proceeding.

For the willingness to share their valuable knowledge and experience, we thank our keynote speakers: Prof. Weijia Jia from Shanghai Jiao Tong University, China; Prof. Dr. Ing Hendro Wicaksono from Jacobs University, Germany; Assoc. Prof. Ferry Jie from Edith Cowan University, Australia; Dr.rer.nat. Fal Sadikin from Philips Eindhoven, Netherlands; and Mr. Doan Lingga from Traveloka. We also send our gratitude to all the invited speakers, Prof. Wahyudi Sutopo, Prof. Aries Susanty, Dr. Singgih Saptadi, Dr. Rifky Ismail, Dr. Dyah Santhi Dewi, Dr. Patdono Suwignyo, Prof. Budi Santosa, Dr. Maria Anityasari, and Dr. Niniet Indah Arvitrida. Besides, we thank the Rector of Institut Teknologi Sepuluh Nopember and the Rector of Diponegoro University for their supports and encouragement. Of course, we would also like to thank the review board members who have played fundamental roles in ensuring the accepted papers are of high quality.

As we know, due to the COVID-19 pandemic, this joint conference is being held in an online system. Therefore, the organizing committee has been trying to create a virtual environment where the attendees can present their research and participate in all the sessions seamlessly. However, we hope that you could be more forgiving and could tolerate whatever hiccups that we may encounter along the way. Finally, we wish you have a fruitful and enjoyable time at the conference. Thank you.

IConISE-ACISE 2020 Conference Chairs

Ratna Sari Dewi, Ph.D & Dr. Manik Mahachandra

Welcome Message

From Rector of ITS Surabaya

On behalf of the Institut Teknologi Sepuluh Nopember (ITS), I am pleased to welcome the Rector of Diponegoro University, Professor Yos Johan Utama; the keynote speakers, Professor Weijia Jia, Professor Hendro Wicaksono, Associate Professor Ferry Jie, Dr Fal Sadikin, and Mr Doan Lingga; our invited speakers, honourable guests, and all participants of the 2nd International Conference on Industrial and System Engineering (IConISE), and the 7th Annual Conference on Industrial and System Engineering (ACISE).

I am genuinely proud that the Department of Industrial and Systems Engineering - ITS has consistently managed to organize such a prestigious conference, attracting scholars, academics, researches, and practitioners from Indonesia and other countries. The International Conference on Industrial and System Engineering (IConISE) is expected to contribute to the achievement of our vision to be a world-class research university. I am very glad that this year, the IConISE of ITS is conducted in collaboration with the Annual Conference on Industrial and System Engineering (ACISE) of Diponegoro University.

The theme of this year's conference is "Big Data Analytics: A Competitive Tools toward Smart Industrial System." This theme is relevant to the current situation where big data has been considered as a robust new technology and valuable solutions for operation cost and time reductions, new product development, and smart decision making. Numerous organizations have started implementing big data, recognizing the benefit they will obtain from it—many start-up companies in the world that have also successfully implemented big data technology. This topic is also very relevant to one of ITS' development strategies, that is, performing Digital Transformation for internal enhancement as well as advancing innovations to the business world. The development of research centres related to Artificial Intelligence dan Internet of Things shows the concern of ITS on the Industrial Revolution 4.0 trend. These efforts also support ITS toward Smart Eco Campus. Thus, I believe this conference will be an excellent opportunity for an in-depth discussion forum and to share experiences and insights on how to manage big data and make it as a key to improving organization performance.

I congratulate the organizing committee from both Industrial and Systems Engineering Department of Institut Teknologi Sepuluh Nopember and Industrial Engineering Department of Diponegoro University. Especially thank Dr Ratna Sari Dewi from ITS and Dr Manik Mahachandra from UNDIP as the conference chairs. The joint organizing committee has worked relentlessly to make 2020 IConISE and ACISE possible.

Last but not least, to our distinguished keynote speakers, invited speakers, and our honourable guests and all participants, I sincerely hope that this conference will facilitate the establishment of international joint research programs and become a forum for the exchange of research ideas. I wish the conference a grand success.

Surabaya, July 2020

Prof. Dr. Ir. Mochamad Ashari, M. Eng.
Rector of Institut Teknologi Sepuluh Nopember

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