Welcome Message from the KSE 2021 General Committee

The 2021 IEEE International Conference on Knowledge and Systems Engineering (KSE) is the 13th meeting of the series, held online during November 10-12, 2021, under the Thailand Time Zone. The first KSE conference was held during October 13-17, 2009, by College of Technology, Vietnam National University (in short, VNU), Hanoi. As an annual meeting, the past KSE conferences were held by University of Engineering and Technology, VNU (in short, VNU-UET), Hanoi and Le Quy Don Technical University (in short, LQDTU) in 2010, by Hanoi University and VNU-UET in 2011, by Danang University of Technology, University of Da Nang, and VNU-UET in 2012, by National University of Education and VNU-UET in 2013, by VNU-UET in 2014, University of Information and Technology, VNU, Ho Chi Minh City and Japan Advanced Institute of Science and Technology (in short, JAIST) in 2015, by LQDTU, JAIST and VNU-UET in 2016, by Hue University of Education, Hue University of Sciences, Hue University, and VNU-UET in 2017, by Telecommunications Institute of Technology, Vietnam (PTIT) and JAIST in 2018, by University of Science and Education, University of Da Nang and VNU-UET in 2019, and by College of Information and Communication Technology, Can Tho University (in short, CTU), and VNU-UET in 2020.

This year, KSE 2021 was originally planned to hold in Bangkok, Thailand but due to the Covid-19 pandemic situation, the conference becomes fully online. The KSE conferences bring together scholars and researchers in the fields of knowledge engineer and systems engineering to exchange their original ideas and current research results with each other.

On behalf of the KSE 2021 committee, we would like to thank our keynote speakers, Prof. Dr. Abdul Sattar from Griffith University, Prof. Dr. Takashi Hashimoto from Japan Advanced Institute of Science and Technology (JAIST), Japan, Prof. Dr. David Lo from Singapore Management University, Singapore, and Asst. Prof. Dr. Teerayut Horanont from SIIT, Thammasat University, Thailand for their insightful speeches. We would also like to express our appreciation to our honorary co-chairs, Prof. Dr. Vilas Wuwongse, AI Association of Thailand, Prof. Dr. Pruettha Nanakorn, SIIT, Thammasat University, Thailand, and Prof. Dr. Nguyen Viet Ha, VNU University of Engineering and Technology, Vietnam for their helpful advice. Thanks to Thepchai Supnithi (NECTEC, Thailand), Lam Thu Bui (Le Quy Don Technical University, Hanoi), and Yoshihiro Miyake (Tokyo Institute of Technology, Japan) for their support as the program co-chairs. Special thanks to Teeradaj Racharak (JAIST, Japan) for his hard work as Secretariat General, Thodsaporn Chay-intr (Tokyo Institute of Technology, Japan), Wirat Chinnan (SIIT, TU, Thailand), and Thanasan Tanhermhong (SIIT, TU, Thailand) for their great effort on proceedings/program preparation, and webmaster tasks. Many thanks to Kiyota Hashimoto (PSU, Thailand) and Thaweekas Yingthawornsuk (KMUTT, Thailand), Vinh Le (Vietnam National University, Hanoi), Xuan-Hieu Phan (Vietnam National University, Hanoi) for their excellent academic support in the conference. Also, thanks to all authors who made good research works and submit their papers to this conference.

We also appreciate our host and co-hosts: Artificial Intelligence Association of Thailand (AIAT, Thailand), Sirindhorn International Institute of Technology (SIIT, Thammasat University, Thailand), IEEE Thailand Section, National Electronics and Computer Technology Center (NECTEC), Vietnam National University, Hanoi (VNU), Japan Advanced Institute of Science and Technology (JAIST), Le Quy Don Technical University, Hanoi (LQDTU), Faculty Institute School University of Information and Communication Technology (FISU). Thank you for all effort and cooperation from the KSE 2021 session chairs, facilitators, and staffs. We are certain that KSE 2021 is another success and hope that it further encourages participants to boldly proceed their research. Wish you get ideas and collaborations during the KSE 2021 conference.

KSE 2021 General Co-Chairs

Nguyen Thanh Thuy, VNU University of Engineering and Technology, Vietnam
Thanaruk Theeramunkong, SIIT, Thammasat University, Thailand
Nguyen Le Minh (JAIST, Japan)

November 10, 2021
Message from the KSE 2021 Program Chairs

The 2021 IEEE International Conference on Knowledge and Systems Engineering (KSE) is an international conference with its scope and topics related to knowledge engineering and systems engineering, together with their underlying theories and empirical findings. The KSE 2021 is the thirteenth of the series and it is held online during November 10-12, 2021, under the Thailand Time Zone.

The KSE 2021 received 89 submissions from China, India, Japan, Myanmar, Philippines, Thailand, and Vietnam. All the papers were rigorously reviewed by at least three anonymous reviewers, and finally we accepted 52 regular papers (58.43%) and 12 short papers (13.48%). Among 52 regular papers, 38 papers are submitted to the regular track and 14 papers are for special sessions. The four special sessions are Special Session on Bioinformatics and Computational Biology (BCB2021), Special Session on Knowledge Integration Technologies and Applications (KITA2021), Special Session on Intelligent Software and Knowledge Representation (IS-KR2021), Special Session on Industry Applications of Business Analytics (IABA2021). Besides these special sessions, there is the workshop session, namely Workshop Session: Automated Legal Question Answering Competition (ALQAC 2021) with eleven teams joining the competition. Out of these teams, two teams were elected to be the winners of the competition. They were invited to submit their methodology and result to the KSE2021 conference. In addition to these two teams, two additional teams have voluntarily submitted their papers. Thanks to all authors for submitting and presenting their excellent research works in this conference.

We would like to thank our keynote speakers, Prof. Dr. Abdul Sattar, Prof. Dr. Takashi Hashimoto, Prof. Dr. David Lo, and Asst. Prof. Dr. Teerayut Horanont for your contribution as keynote speakers. Special thanks to all the reviewers who spent their valuable time to review and evaluate the submitted papers. Also, thanks to the session chairs, facilitators, and staffs who help and cooperate in organizing the KSE 2021 conference.

Enjoy the KSE 2021 conference and wish all of you get fruitful discussion.

KSE 2021 Program Co-Chairs

Thepchai Supnithi, NECTEC, Thailand
Lam Thu Bui, Le Quy Don Technical U., Hanoi
Yoshihiro MIYAKE, Tokyo Insitute of Technology, Japan

November 10, 2021