# PROCEEDINGS OF SPIE

# International Conference on Mechatronics and Intelligent Control (ICMIC 2024)

Kun Zhang Pascal Lorenz Editors

20–22 September 2024 Wuhan, China

Organized by American Natural Science and Technology (United States)

Sponsored by
IEEE ComSoc France Chapter (France)
IEEE RAS Guangzhou Chapter (China)

Published by SPIE

**Volume 13447** 

Part One of Two Parts

Proceedings of SPIE 0277-786X, V. 13447

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

International Conference on Mechatronics and Intelligent Control (ICMIC 2024), edited by Kun Zhang, Pascal Lorenz, Proc. of SPIE Vol. 13447, 1344701 © 2025 SPIE · 0277-786X · doi: 10.1117/12.3058242

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings: Author(s), "Title of Paper," in International Conference on Mechatronics and Intelligent Control (ICMIC 2024), edited by Kun Zhang, Pascal Lorenz, Proc. of SPIE 13447, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510686830

ISBN: 9781510686847 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2025 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

## Contents

xv Conference Committee

#### **Part One**

### **AUTOMATION AND CONTROL SYSTEMS** 13447 02 A power-voltage coordinated control strategy of inverters in low-voltage distribution **networks** [13447-177] 13447 03 Research on mechanical vibration control technology in improving environmental safety **in mining** [13447-215] 13447 04 Research on the automated generation method of laboratory testing report [13447-198] 13447 05 Research on the application of machine vision technology in industrial automation **assembly line** [13447-218] 13447 06 Research on medical efficiency of Beijing-Tianjin-Hebei based on SBM model [13447-98] 13447 07 Effectiveness of fostering innovation and talents in automation engineering education through engineering practice innovation project (EPIP) teaching model [13447-154] Design of automated container layout and resource optimization algorithm based on 13447 08 cloud computing technology [13447-145] **IMAGE AND SIGNAL PROCESSING** 13447 09 Enhanced Bayesian network classifier for intrusion detection: integrating semilazy learning and multiconditional entropy [13447-158] 13447 0A ASTGNN: adaptive spatio-temporal graph neural network for motor imagery recognition [13447-185] 13447 OB Performance optimization and comparative analysis of distributed big data processing framework [13447-197] 13447 0C Research on the key technology of high-precision electron probe in the detection of mineral composition [13447-201] Investigation of a novel approach to facial emotion detection using an 13447 0D attention-enhanced residual network [13447-190]

13447 OE	Research on false propaganda detection technology based on LLM and BERT [13447-222]
13447 OF	Threat target image detection method based on two-stage R-CNN network [13447-200]
13447 0G	Low-light underwater image enhancement method based on brightness estimation [13447-205]
13447 OH	Target detection method based on event-time surface feature fusion network [13447-209]
13447 01	A study on rapid recognition of ripe tomato fruits in complex environment based on YOLOv5s [13447-150]
13447 OJ	Mixed detection of grape leaf and fruit diseases based on Yolov5s [13447-151]
13447 OK	Named entity recognition method based on boundary-aware attention mechanism and generative adversarial network [13447-23]
13447 OL	Tobacco shred varieties detection based on Yolov7 [13447-46]
13447 OM	Real-time detection of cracks: improved YOLOv8 network applied to wooden structure of residential historic buildings [13447-36]
13447 ON	Garbage object detection based on improved YOLOv7 [13447-119]
13447 00	Lightweight facial expression recognition based on joint model compression [13447-106]
13447 OP	Improve the semantic perception ability of CNN-based object detection systems with attention model [13447-132]
13447 0Q	Natural language processing-based translating style research of two representative translating versions from data-driven methodology [13447-61]
13447 OR	Research and development of plateau portable landslide detection equipment based on Jetson Nano [13447-30]
13447 OS	<b>Ship-YOLOv5s:</b> improved YOLOv5 ship target detection based on attention mechanism [13447-65]
13447 OT	Research on sensitive content and file security detection platform [13447-26]
	ROBOTICS
13447 OU	A new large-scale steel bar mesh welding method using vision-guided robot system and application on bridge tower construction [13447-188]
13447 OV	Design of an intelligent picking robot based on Raspberry Pie and Arduino control [13447-42]

13447 OW	Human-robot cooperative assembly key information extraction based on GCN [13447-105]
13447 OX	Design of template handling in steel mill based on robot [13447-63]
13447 OY	Structural design and control of snake-like soft magnetorheological fluid robot [13447-10]
	MECHATRONICS
13447 OZ	The application of mechatronics integration technology in intelligent logistics and warehouse management [13447-147]
13447 10	Research on the security of e-commerce transactions and data privacy system with block chain technology [13447-164]
13447 11	Design and optimization of joint inspection system for transmission transformer and distribution equipment based on UAV technology [13447-167]
13447 12	Design of automotive anti-theft system based on IoT and multisensor fusion [13447-231]
13447 13	Research on the risk control of straw power generation supply chain based on system dynamics [13447-172]
13447 14	CFD simulation of hovercraft branch intake system under high-speed hovering navigation conditions [13447-174]
13447 15	Research on the design of interactive system for nature museum based on XR technology [13447-178]
13447 16	Diversified value assessment and collaborative ecological research on the user-side energy storage of Chongqing's new power system [13447-175]
13447 17	System integration and software platform engineering implementation of digital twin model for ultra-high-voltage converter valve side bushing [13447-226]
13447 18	Establishment of mathematical model and operation strategy for energy storage in input type power system [13447-234]
13447 19	Analysis of the smoothness of baggage handling based on the current status of baggage handling system operations $[13447-14]$
13447 1A	Wearable human-machine integrated control system [13447-70]
13447 1B	Research and implementation of a simulation training system for grid control strategies with integration of distributed new energy sources and energy storage devices [13447-111]
13447 1C	Analysis of a typical full-cushion hovercraft maneuvering control system [13447-73]

13447 1D	Research on intrusion tolerance system based on behavioral baseline and defense-in- depth architecture [13447-47]
13447 1E	Design and development of safety monitoring system for LNG ship [13447-31]
13447 1F	Research on spares optimization method of the complex electronic information system based on Monte Carlo simulation [13447-25]
13447 1G	Construction of digital anatomy experiment teaching system based on VR technology [13447-139]
	A DELECTAL INTELLIGENCE AND INTELLIGENT CONTROL
	ARTIFICIAL INTELLIGENCE AND INTELLIGENT CONTROL
13447 1H	The application of artificial intelligence in computer network technology in the era of big data [13447-206]
13447 11	Algorithm for cigarette carton label target recognition based on YOLOv3 [13447-223]
13447 1J	Research on personalized recommendation system of e-commerce intelligent customer service based on artificial intelligence technology [13447-161]
13447 1K	Research on an intelligent system for optimizing the ranking of e-commerce product search results using deep learning algorithm [13447-163]
13447 1L	Realization of digital protection algorithm of national traditional culture based on virtual reality technology [13447-165]
13447 1M	Algorithm implementation of digital protection system for traditional cultural industry based on grey clustering [13447-166]
13447 1N	Fault diagnosis of low-speed rolling bearing based on quality-adjustable wavelet denoising [13447-160]
13447 10	Embedded intelligent pension system based on deep learning [13447-168]
13447 1P	Research on the development status, applications, and trend of flapping wing aircraft [13447-221]
13447 1Q	Research on wind induced vibration of pillars under helicopter platform [13447-173]
13447 1R	Retinal vessel segmentation based on adaptive fuzzy local information C-means clustering [13447-193]
13447 1S	Research on low carbon energy integration and intelligent heating control in urban heating networks [13447-232]
13447 1T	Duplicate packet detection algorithm based on balanced binary tree [13447-191]

13447 1U	Selecting the most important variables for crime prediction based on machine learning approaches [13447-162]
13447 1V	Improved genetic algorithm for optimizing flexible workshop scheduling [13447-180]
3447 1W	A design of management software for satellite edge computing payloads [13447-159]
13447 1X	Helmet detection models based on deep learning [13447-176]
13447 1Y	Assessment and management of security risks in accounting information systems from a lifecycle perspective [13447-235]
13447 1Z	DTS: dynamic traffic scrubbing against link flooding attacks with programmable data plane [13447-181]
13447 20	Location data publishing mechanism in semi-trusted vehicle networks based on differential privacy [13447-182]
13447 21	QSM: a quick shuffling method for defending against low-rate denial of service attacks in microservice systems [13447-183]
13447 22	Vehicle pseudonym change mechanism based on dynamic game [13447-184]
13447 23	LeadMoldNet: a convolutional neural network-based approach for lead impression analysis [13447-171]
13447 24	Research on the dynamic response of adjacent structure induced by the vibration load of subway [13447-186]
13447 25	Exploration and analysis of security incident handling work in security protection for critical information infrastructure [13447-213]
13447 26	Study on the simulation method of material removal process of five-axial CNC machining [13447-192]
13447 27	Design of media communication and network transmission architecture based on 5G and edge computing [13447-233]
13447 28	Research on adaptive factor graph fusion perception method for transmission line crossing under multisensor collaboration [13447-225]
13447 29	Research on optimization control model and algorithm for sewage treatment process [13447-214]
13447 2A	Research on intelligent sensor network technology for mine environment monitoring [13447-216]
13447 2B	Study on intelligent assessment of hazardous chemical leakage risk and optimization model of emergency response [13447-217]

13447 2C	Simulation analysis of explosion shock wave damage to Coyote UAV structure [13447-179]
13447 2D	Key technologies for general design of multipurpose liftboat with large operational air gap [13447-208]
13447 2E	A statistical features analysis of service network based on complex network method [13447-219]
13447 2F	Design and optimization of feedback retransmission protocol based on cyclic redundance check [13447-195]
13447 2G	Analysis and measures of pH rising for circulating water in indirect air cooling unit [13447-199]
13447 2H	Influence of charging in different mediums on the effectiveness of warship's side destruction [13447-212]
13447 21	Multibranch underwater image reconstruction algorithm integrating attention features [13447-207]
13447 2J	Optical flow estimation in the dark with multilevel noise generation [13447-203]
13447 2K	An adaptive golden jackal optimization algorithm for mobile robotic path planning [13447-210]
13447 2L	Deep-learning-based icing identification method for unmanned aerial vehicle [13447-204]
13447 2M	A backtracking-based combinatorial optimization algorithm for target matching in account reconciliation [13447-211]
13447 2N	Research on spatio-temporal non-uniformity reduction algorithm and finite element method verification of digital twin model of ultra high-voltage valve side bushing [13447-227]
13447 20	Leveraging foundational mathematics for advancements in artificial intelligence [13447-224]
13447 2P	Comparative study on machine learning algorithm prediction of soybean protein localization [13447-50]
Part Two	
13447 2Q	The application of self-similarity in architectural design [13447-3]
13447 2R	Reflections on the employment of college students based on big data reform and development of talent training model in higher education [13447-37]

13447 2S	Data mining syllabic patterns in US political party platforms [13447-59]
13447 2T	Research on reliability-based topology optimization of offshore wind farm collection and delivery [13447-89]
13447 2U	Aerodynamic design of ultra-high-load axial flow compressor [13447-38]
13447 2V	Teaching environment design based on VRML virtual reality technology [13447-43]
13447 2W	Research on the application of collaborative learning based on smart classrooms [13447-92]
13447 2X	Research on collaborative measurement method of large-size curved structural parts [13447-125]
13447 2Y	Research on federated model algorithm based on non-independent identically distributed data sets [13447-130]
13447 2Z	H∞ synthesis design of electric vehicle powertrain systems [13447-101]
13447 30	University network intrusion detection method based on deep learning [13447-45]
13447 31	Revolutionizing supply chain finance with blockchain: a comprehensive analysis of smart contracts and beyond [13447-55]
13447 32	Simulation and risk assessment of rolling stone disaster on highway slope based on big data [13447-115]
13447 33	Knowledge graph completion method by hierarchically aggregating multirelational neighborhood information [13447-107]
13447 34	A robust multiview fuzzy clustering method combining local spatial information [13447-122]
13447 35	Fall detection algorithm based on improved Yolov7 [13447-117]
13447 36	Design and research on KVM-based cloud desktop solution for VDI converged architecture [13447-33]
13447 37	Comprehensive advanced geological prediction technology and application of tunnels [13447-99]
13447 38	Seismic performance study of electromechanical antiseismic support hangers under earthquake simulation conditions [13447-66]
13447 39	Study on dams health monitoring based on modal parameters [13447-5]
13447 3A	HeterSim: enable flexible simulation for heterogeneous distributed deep learning platform [13447-155]

13447 3B	Research and application of large-scale vehicle video hash technology [13447-24]
13447 3C	MRI reconstruction based on constrained probabilistic under-sampled mask and denoising diffusion probabilistic model [13447-128]
13447 3D	An improved Yolov5-based algorithm for pavement disease detection in airport flight areas [13447-112]
13447 3E	Research on precision manufacturing technology of space high-sealing and long-life plunger type constant current output device [13447-90]
13447 3F	A simulation and optimization approach for planning the production of engine parts using ACF-GA [13447-93]
13447 3G	Analysis of the impact of government-enterprise behavior on electricity load characteristics in Chongqing region [13447-57]
13447 3H	Intelligent identification method of coal seam roof water source based on random forest algorithm [13447-80]
13447 31	Research on liquid-solid numerical simulation of annular jet pump [13447-127]
13447 3J	Computer-assisted knowledge points and question difficulty classification based on BERT [13447-251]
13447 3K	Use neural networks to recognize students' handwritten letters and incorrect symbols [13447-156]
13447 3L	Research on reference model establishment method for articulated steering vehicle [13447-67]
13447 3M	Applying self-attention mechanism to realize battery life prediction based on early cycle features [13447-48]
13447 3N	Deep-learning-based prediction of mesoscale eddy distribution in the South China sea [13447-100]
13447 30	Accumulative plasticity analysis of hull structures with surface cracks under low-cycle fatigue loading [13447-60]
13447 3P	A 3D information supplementary acquisition method for fundamental geo-entity data [13447-15]
13447 3Q	Improved path selection algorithm for ship evacuation [13447-12]
13447 3R	Research on SDN-based resilient network technology architecture for intelligent ships [13447-62]

13447 3S	Assessment of air conditioning load aggregation response potential considering multiple factors [13447-64]
13447 3T	Planning of distributed power sources in coastal power distribution networks considering the impact of uncertainty [13447-18]
13447 3U	Research on the allocation of urban shared bicycle parking spots [13447-8]
13447 3V	Structural strength analysis of conduit rack platform [13447-39]
13447 3W	Traffic flow prediction using LSSVM optimized by the bat algorithm [13447-86]
13447 3X	Application of colored stochastic Petri nets in rapid simulation of airport operation environment [13447-76]
13447 3Y	Research on the performance of OFDM and similar modulation modes [13447-75]
13447 3Z	Volute optimization and CFD analysis of Francis turbine [13447-17]
13447 40	A functional safety analysis approach for random hardware failure of automotive-grade chips [13447-34]
13447 41	Research and optimization of SM9 based on a modular design [13447-11]
13447 42	Analysis and modeling the influence of distributed propeller slipstreams on aircraft wing [13447-123]
13447 43	Design and implementation of adaptive architecture for complex algorithms [13447-9]
13447 44	Fusion of sparse direct method and feature-based approach in stereo point-line SLAM algorithm [13447-153]
13447 45	Construction and analysis of wooden pallets recycling model based on closed-loop supply chain [13447-237]
13447 46	Scheduling optimization based on assessment of adjustable potential of large-scale industrial loads [13447-28]
13447 47	Load adjustable potential assessment method for large industrial users based on decadal time scale [13447-32]
13447 48	Ship dynamic autonomous collision avoidance model based on improved velocity obstacle [13447-108]
13447 49	Comprehensive evaluation method of offroad capability of special electric vehicles [13447-114]
13447 4A	Research on indoor target ranging based on improved Yolov5 [13447-54]

13447 4B	The design and implementation of intelligent maintenance management system for mountainous highway [13447-41]
13447 4C	Statistical analysis and treatment of faults in national meteorological observation station [13447-149]
13447 4D	An algorithm for counting drill pipe in coal mine based on human posture recognition [13447-49]
13447 4E	Resilience assessment of power grid's key material supply chain based on cloud model [13447-53]
13447 4F	Simulation optimization of welding workshop layout based on simulated annealing algorithm for cluster layout framework [13447-249]
13447 4G	Study on the application of improved target detection algorithm for UAV in maritime search and rescue [13447-121]
13447 4H	OFDM/OQAM adaptive pulse shaping [13447-113]
13447 41	Research on flood season runoff forecast based on a novel combination machine learning method [13447-126]
13447 4J	Freeze-thaw damage mechanism and multifield coupling simulation analysis of port hydraulic concrete buildings [13447-87]
13447 4K	Data storage mechanism analysis of pumped storage power stations based on block chain [13447-35]
13447 4L	Analysis of interphase discharge faults on transmission lines under the action of upwind on the windward slope [13447-51]
13447 4M	Construction of a student information literacy evaluation model based on BP neural network algorithm [13447-169]
13447 4N	Design of university innovation and entrepreneurship system based on cloud model data mining algorithm [13447-131]
13447 40	Sales data analysis and product layout analysis model based on association rule mining algorithm [13447-133]
13447 4P	Research on the spatial distribution and influencing factors of B&Bs in Liangshan prefecture based on GIS spatial analysis and spatial econometric model [13447-170]
13447 4Q	Addressing information bias in multimodal recommendation systems based on expert systems [13447-134]
13447 4R	Corpus acquisition method based on neural network [13447-1]

13447 4S	Carbon asset value evaluation method and management suggestions for power grid enterprises based on big data [13447-135]
13447 4T	The application of artificial intelligence in the design of medical students' foreign language micro-video learning platform [13447-136]
13447 4U	The application of intelligent speech analysis in college English oral learning system [13447-137]
13447 4V	Building an English learning community model assisted by AI and VR technologies [13447-138]
13447 4W	A convolutional neural network face recognition algorithm based on bootstrapping [13447-140]
13447 4X	Construction of intelligent sharing financial management system based on deep learning [13447-141]
13447 4Y	Research on the application of big data mining technology based on neural network [13447-229]
13447 4Z	Intelligent substation cost management and development countermeasures based on big data technology [13447-230]
13447 50	A generative adversarial network face recognition algorithm based on mean feature matching [13447-142]
13447 51	A graph convolutional network face recognition algorithm based on clustering [13447-144]
13447 52	Research on intelligent upgrade strategy of digital platform based on machine learning [13447-146]
13447 53	The design of smart data construction and service based on multiply organizational data technology [13447-238]

# **Conference Committee**

#### Conference Chairs

Filippo Sanfilippo, University of Agder (Norway)
 Shunli Wang, Inner Mongolia University of Technology (China)
 Yongping Pan, Sun Yat-Sen University (China)
 Shashikant Patil, ATLAS SkillTech University, Mumbai (India)
 Vinayakumar Ravi, Prince Mohammad Bin Fahd
 University (Saudi Arabia)

#### Co-Chair

**Zhaohua Liu**, Hunan University of Science and Technology (China)

#### **Program Chairs**

Yang Yue, Xi'an Jiaotong University (China)
Huiyu Zhou, University of Leicester (United Kingdom)

#### **Publishing Chair**

**Shiling Zhang**, State Grid Chongaina Electric Power Company (China)

#### Technical Program Committee

Javier Gozalvez, Universidad Miguel Hernandez de Elche (Spain)

T. Velmurugan, University of Madras (India)

S. Rajesh, Mepco Schlenk Engineering College (India)

**Jose Anand**, KCG College of Technology (India)

**Abdel Ghani Aissaoui**, University of Tahri Mohamed of Bechar (Algeria)

Kamel Barkaoui, Conservatoire National des Arts et Métiers (France)

**Gheorghe Grigoras**, "Gheorghe Asachi" Technical University of Iasi (Romania)

**Jianwei Liu**, China University of Petroleum (China)

**Zhengming Gao**, Jingchu University of Technology (China)

**Lianwu Guan**, Harbin Engineering University (China)

**Mohamed Gomaa**, National Research Centre (Egypt)

Dan Dobrota, Lucian Blaga University of Sibiu (România)

Barenya Bikash Hazarika, Assam Down Town University (India)

Qibin Li, Chongging University (China)

**Alexey Nekrasov**, Southern Federal University (Russian Federation)

Lu Leng, Nanchang Hangkong University (China)

**Qingsheng Zeng**, Nanjing University of Aeronautics and Astronautics (Canada)

Jianhua Wu, Nanchang University (China)

Muazzam Ali Khan Khattak, Quaid-i-Azam University (Pakistan)

**Vinayakumar Ravi**, Prince Mohammad Bin Fahd University (Saudi Arabia)

Narendra Londhe, National Institute of Technology Raipur (India)

Loc Nguyen, Loc Nguyen's Academic Network (Vietnam)

Xuexi Zhang, Harbin Institute of Technology (China)

Fateh Mebarek-Oudina, University of 20 Août 1955-Skikda (Algeria)

Zezhong Xu, Changzhou Institute of Technology (China)

Farid Abed-Meraim, Arts et Métiers ParisTech (France)

**Wuyi Yue**, The Kyoto College of Graduate Studies for Informatics (Japan)

**Shuangming Yang**, Tianjin University (China)

Narendra Londhe, National Institute of Technology, Raipur (India)

Fathollah Bistouni, Islamic Azad University (Iran, Islamic Republic of)

**Cheng Siong Chin**, Newcastle University in Singapore (Singapore)

**Anand Nayyar**, Duy Tan University (Vietnam)

Samir Ladaci, National Polytechnic School of Algiers (Algeria)

**Simon K.S. Cheung**, Hong Kong Metropolitan University (China)

Jupeng Ding, Xinjiang University (China)

**WenTsai Sung**, National Chin-Yi University of Technology, Taiwan (China)

**Basavanna M**, GSSS Institute of Engineering and Technology for Women (India)

Sameer Faisal, ComsatsS University Islamabad (Pakistan)

Mutaz Ryalat, German Jordanian University (Jordan)

Ioan-Lucian Popa, University Alba Iulia (Romania)

Denis Sidorov, Russian Academy of Sciences (Russian Federation)

**Xiaochun Cheng**, Swansea University (United Kingdom)

**Huanjie Tao**, Northwestern Polytechnical University (China)

Gyu Myoung Lee, Liverpool John Moores University (United Kingdom)

**Abdelhamied Ashraf Ateya**, Zagazig University (Egypt)

**Yassen Gorbounov**, University of Mining and Geology "St. Ivan Rilski", Sofia (Bulgaria)

lan Okoth, Technical University of Kenya (Kenya)

**Jawaid Daudpoto**, Mehran University of Engineering and Technology (Pakistan)

Manpreet Kaur, Manay Rachna University (India)

**Prasenjit Banerjee**, MuleSoft and Salesforce (United States)

**Amal Al-kraimeen,** Tafila Technical University (Jordan)

**Hu Jiang**, Innovation Academy for Microsatellites, Chinese Academy of Sciences (China)

**Sachin Kumar**, Galgotias College of Engineering and Technology (India)

Samir Ladaci, National Polytechnic School of Algiers (Algeria)