Seventh International Symposium on Instrumentation and Control Technology

Sensors and Instruments, Computer Simulation, and Artificial Intelligence

Jiancheng Fang
Zhongyu Wang
Editors

10–13 October 2008
Beijing, China

Organized by
Beijing University of Aeronautics & Astronautics (China)

Sponsored by
NSFC—National Natural Science Foundation of China (China)
CSM—Chinese Society for Measurement (China)
CIS—Chinese Instrument Society (China)
CSAA—Chinese Society of Aeronautics and Astronautics (China)
CSA—Chinese Society of Astronautics (China)
CAA—Chinese Association of Automation (China)

Published by
SPIE

Volume 7127
## Contents

### xi  Conference Committees

### SENSORS AND INSTRUMENTS

<table>
<thead>
<tr>
<th>7127 02</th>
<th>Strain measurement using FBG Fabry-Perot sensor [7127-01]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L. Liu, Northeastern Univ. (China) and Northeastern Univ. at Qinhuangdao (China); Z. Wu, A. Song, Northeastern Univ. at Qinhuangdao (China); D. Yan, Northeastern Univ. (China) and Northeastern Univ. at Qinhuangdao (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 03</th>
<th>Research on ADV-Hop localization algorithm in wireless sensor networks [7127-02]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S. Zhao, Univ. of Science and Technology Beijing (China) and China Univ. of Petroleum (China); X. Xu, China Univ. of Petroleum (China); Z. Zhang, Univ. of Science and Technology Beijing (China); M. Sun, China Univ. of Petroleum (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 04</th>
<th>Distributed FBG accelerometer based on signal reconstruction [7127-03]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Z. Wu, A. Song, D. Yan, Northeastern Univ. at Qinhuangdao (China); Z. Li, Yanshan Univ. (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 05</th>
<th>Implementation and imaging of a modified laser polarimetric remote sensing system [7127-04]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X. Zhang, Y. Jiang, X. Lu, L. Shen, Beijing Univ. of Aeronautics and Astronautics (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 06</th>
<th>Research on numerical control system based on S3C2410 and MCX314AL [7127-05]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q. Ren, T. Jiang, Guilin Univ. of Electronic Technology (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 07</th>
<th>A new type of wet gas online flow meter based on dual slotted orifice plate [7127-06]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Y. Li, L. Meng, J. Wang, Y. Geng, China Univ. of Petroleum (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 08</th>
<th>Design and analysis of hybrid thrust magnetic bearing for magnetically suspended reaction wheel [7127-07]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B. Han, Beijing Univ. of Aeronautics and Astronautics (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 09</th>
<th>Digital remote image surveillance system based on ARM [7127-08]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L. Qu, Yantai Univ. (China); J. Sun, Yantai Vocational College (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 0A</th>
<th>Study on performance test on force-sensor of multi-support rotor-bearing test-bed [7127-09]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X. Pang, Z. Yang, H. Lu, Q. Liang, H. Sun, Taiyuan Univ. of Technology (China)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7127 0B</th>
<th>Response of capacitive micromachined ultrasonic transducers [7127-10]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L. Ge, Anhui Univ. (China)</td>
</tr>
</tbody>
</table>
Design for intelligent discharging monitor-discharging control system based on ARM + CPLD [7127-11]
Q. Cai, H. Yuan, Guangxi Univ. of Technology (China); R. Wang, Shenzhen Pluke Intelligent Test Equipment Co., Ltd. (China)

A novel micro-electromechanical resonant gyroscope [7127-12]
S. Fan, L. Wang, Z. Guo, Beihang Univ. (China) and State Key Labs. of Transducer Technology (China)

Identification of two-phase flow regime based on electrical capacitance tomography and soft-sensing technique [7127-13]
L. Zhang, Tianjin Univ. (China) and North China Electric Power Univ. (China); H. Wang, Tianjin Univ. (China)

Design of football robot based on DSP [7127-14]
M. Zhao, X.-Y. Hu, Y. Shao, B. Luo, X. Wang, Chongqing Institute of Technology (China)

Digital interface of electronic transformers based on embedded system [7127-15]
Q. Shang, Y. Qi, North China Electric Power Univ. (China)

Design of GLP lab environment parameters monitor system based on Schneider PLC [7127-16]
X. Lian, H. Xu, Z. Duan, Y. Zhang, Beijing Technology and Business Univ. (China)

Development of an intelligent bedsore prevention system based on multi-channel pressure signals analysis [7127-17]
X. Hao, R. Zhou, Inner Mongolia Univ. (China)

Simulative investigation on sensing field and optimum configuration of electromagnetic tomography sensor array [7127-18]
D. Liu, F. Dong, Tianjin Univ. (China)

Characteristic analysis and simulation for polysilicon comb micro-accelerometer [7127-19]
F. Liu, Y. Hao, Shenyang Ligong Univ. (China)

Enhanced haptic rendering with a hyper-threading architecture [7127-20]
X. Lu, A. Song, Southeast Univ. (China)

Design of temperature control system for perfusion hyperthermia based on MCU and FPGA [7127-21]
L. Chen, J. Zhu, X. Zhang, He'nan Univ. of Science and Technology (China); Z. Wang, Beijing Univ. of Aeronautics and Astronautics (China)

Software design of inertial navigation device integrated test system based on virtual instruments [7127-22]
Z. Zhang, J. Liu, Y. Liu, BeiHang Univ. (China)

Estimation of uncertainty in CMM cylindricity measurement according to new GPS standard system [7127-23]
Y. Zhang, C. Ding, H. Du, X. Hu, Zhejiang Industry Polytechnic College (China)
The design of the airborne recorder for the answering machine responder [7127-24]
J. Zhao, L. Zhan, The First Aeronautical College of PLA (China)

Two-phase flow patterns characteristics analysis based on image and conductance sensors [7127-25]
Z. Wang, N. Jin, C. Wang, J. Wang, Tianjin Univ. (China)

A novel current-mode universal filter with three inputs and single output using MO-CCCIIs [7127-26]
J. Jiang, W. Ma, J. Zhao, J. Liu, Wuhan Univ. (China)

Parametric calibration of 3-coordinate measuring machines by transfer standards and conventional techniques [7127-27]
A. W. Khan, Beihang Univ. (China)

Robust target localization with multi-party cooperation in wireless sensor networks [7127-28]
L. Ding, X. Wang, D. Bi, Tsinghua Univ. (China)

Design for information collection and wireless transmission equipment of public electric vehicle [7127-29]
J. Bi, W. Guan, G. Zhu, W. Li, Beijing Jiaotong Univ. (China)

An application of GA to normal and malignant tissues cluster analysis [7127-30]
X. Li, G. Zhang, Y. Yuan, Q. Li, BeiHang Univ. (China); J. Wu, Peking Univ. (China)

Study on digital closed-loop system of silicon resonant micro-sensor [7127-31]
Y. Xu, M. He, Beihang Univ. (China)

High speed COMS Image acquisition and transmission system based on USB [7127-32]
Y. Cui, J. Jiang, G. Zhang, BeiHang Univ. (China)

A decoupled micro-electromechanical resonant gyroscope [7127-33]
L. Wang, S. Fan, Z. Guo, BeiHang Univ. (China), Key Lab. of Precision Opto-mechanics Technology (China), and State Key Labs. of Transducer Technology (China)

A novel fusion method of conflicting evidences for clustering wireless sensor networks [7127-34]
B. Chen, Beijing Univ. of Posts and Telecommunications (China); R. Feng, J. Wan, Beijing Univ. of Aeronautics and Astronautics (China)

Research on the closed-loop system of silicon resonant micro-sensor based on FPGA [7127-35]
J. Zhong, H. Zhou, Beihang Univ. (China)

Research on error model of involute helicoid based on coordinate measuring machine [7127-36]
X. Wen, L. Zhu, Q. Chen, Y. Yan, Beijing Information Science and Technology Univ. (China)

Microstructure silicon force sensor and its simulation [7127-37]
A. E. M. Mohamed, S. Fan, Z. Guo, Beijing Univ. of Aeronautics and Astronautics (China)
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>A new calibration method of electronic transformer applied in power system</td>
<td>Z. Qian, C. Liu, Beijing Univ. (China)</td>
</tr>
<tr>
<td>14</td>
<td>Research on angle actuator of spatial resonance MOEMS gyroscope</td>
<td>Z. Pan, H. Liu, L. Feng, Beijing Univ. (China)</td>
</tr>
<tr>
<td>15</td>
<td>Optimal design of drives for high acceleration by use of physical considerations</td>
<td>H. Grotstollen, Univ. of Paderborn (Germany)</td>
</tr>
<tr>
<td>17</td>
<td>Research of piezoelectric sensor array in structural health monitoring</td>
<td>Z. Fu, M. Yuan, D. Sun, W. Liu, Beijing Univ. (China)</td>
</tr>
<tr>
<td>18</td>
<td>A piezoelectric actuator-driven loading device for mechanical condition during bone tissue engineering</td>
<td>C. Q. Zhang, Tianjin Univ. of Technology (China); H. Wu, China-Japan Friendship Hospital, Jilin Univ. (China); X. Dong, Jilin Univ. (China)</td>
</tr>
<tr>
<td>19</td>
<td>Wet gas metering by using a long-throat Venturi meter</td>
<td>L. Xu, H. Li, J. Xu, Beijing Univ. (China)</td>
</tr>
<tr>
<td>1A</td>
<td>An electron analyzer</td>
<td>A.-B. Zhang, Ctr. for Space Science and Applied Research (China) and Graduate Univ. of Chinese Academy of Sciences (China); L.-G. Kong, S.-J. Wang, L. Li, X.-Z. Zheng, Ctr. for Space Science and Applied Research (China)</td>
</tr>
<tr>
<td>1B</td>
<td>Experimental and theoretical study on THz spectrum artemisante</td>
<td>B. Zhou, Beijing Univ. of Aeronautics and Astronautics (China); F. Wu, Capital Normal Univ. (China)</td>
</tr>
<tr>
<td>1C</td>
<td>Research on a measurement principle of the double-flank gear rolling test with many degrees of freedom for fast inspection</td>
<td>Z. Shi, J. Tang, Beijing Univ. of Technology (China)</td>
</tr>
</tbody>
</table>

**COMPUTER SIMULATION AND ARTIFICIAL INTELLIGENCE**

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1D</td>
<td>Analysis of experimental result and fault diagnosis for aeroengine rotating shaft</td>
<td>B. Zhao, Hebei Univ. of Engineering (China); Y. Wang, Beijing Univ. of Aeronautics and Astronautics (China)</td>
</tr>
<tr>
<td>1E</td>
<td>Integrating Simulink debugger with .NET to enhance interactivity: a case study for hydraulic pump system simulation</td>
<td>Z. Gao, X. Li, J. Yu, C. Liao, Beijing Univ. (China)</td>
</tr>
</tbody>
</table>
Surface smoothness detection algorithm based on two-dimensional wavelet and computer vision [7127-50]
J. Yang, Beijing Univ. of Posts and Telecommunications (China) and Beijing Institute of Machinery (China); N.-G. Lu, Beijing Institute of Machinery (China) and Beijing Univ. of Posts and Telecommunications (China); M. Dong, Beijing Institute of Technology (China)

RBF neural network prediction on weak electrical signals in Aloe vera var. chinensis [7127-51]
L. Wang, China Jiliang Univ. (China); J. Zhao, Wuxi Entry-Exit Inspection and Quarantine Bureau (China); M. Wang, Zhejiang Univ. (China)

Kinematics modeling of hydraulic manipulating test-bed [7127-52]
L. Xue, S. Wang, S. Zhao, Beijing Univ. of Aeronautics and Astronautics (China)

Research on scheme of applying ASON to current networks [7127-53]
Y. F. Mao, Zhengzhou Univ. of Light Industry (China); J. R. Li, Henan Vocational and Technical Institute (China); L. J. Deng, Zhengzhou Univ. of Light Industry (China)

A novel hierarchical BP model for strip flatness pattern recognition [7127-54]
X. Zhao, Z. Zhang, Univ. of Science and Technology Beijing (China); X. Wang, Hi-Spec Solutions, Honeywell (China) Co., Ltd. (China)

Power quality event detection and analysis in power system using wavelet transformation [7127-55]
G. Ding, P. Pang, Hebei Univ. of Engineering (China)

The simulation of hydraulic controllable shut-off valve based on dynamic mesh technology [7127-56]
J. Wu, Z. Kou, Taiyuan Univ. of Technology (China)

Simulation and experimental validation of substrate noise reduction techniques for power switching circuits [7127-57]
J. Yang, H. Zhao, I. Zheng, T. Mao, W. Li, R. Wang, Freescale Semiconductor (China) Ltd. (China)

Fault diagnosis model of DGA for power transformer based on FCM and SVM [7127-58]
H. Sun, L. Sun, Q. Liu, S. Wang, K. Sun, Hebei Univ. of Science and Technology (China)

Application of simple dynamic recurrent neural networks in solid granule flowrate modeling [7127-59]
Y. Du, H. Sun, Hebei Univ. of Science and Technology (China); Q. Tian, H. Ren, Shijiazhuang Realty Administrative Office (China); S. Zhang, Hebei Univ. of Science and Technology (China)

A new behavioral modeling approach for digital I/O ports [7127-60]
J. Shen, M. Jiang, Q. Zheng, Zhejiang Normal Univ. (China); Y. Guo, Hangzhou Dianzi Univ. (China)

Morphological segmentation of x-ray images [7127-61]
W. Zheng, H. Yang, Hebei Univ. (China); H. Sun, H. Fan, No. 252 Hospital of PLA (China)
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>7127 1R</td>
<td>Pattern recognition and analysis of short duration disturbance based on neural network</td>
<td>H. Wang, Hebei Univ. of Engineering (China)</td>
</tr>
<tr>
<td>7127 1S</td>
<td>Study on static and dynamic modeling of nonlinear system</td>
<td>L. Qu, Harbin Engineering Univ. (China) and BeiHua Univ. (China); H. Wang, X. Bian, K. Wang, Harbin Engineering Univ. (China)</td>
</tr>
<tr>
<td>7127 1T</td>
<td>A novel impedance model based sensorless operation of PMSM</td>
<td>J. Liu, G. Liu, G. Li, Beijing Univ. of Aeronautics and Astronautics (China)</td>
</tr>
<tr>
<td>7127 1U</td>
<td>3D face database for human pattern recognition</td>
<td>L. Song, L. Lu, Southwest Univ. of Science and Technology (China)</td>
</tr>
<tr>
<td>7127 1V</td>
<td>Gas/liquid two-phase flow regime recognition by combining the features of wavelet transform energy with the improved Elman network</td>
<td>J. Han, Tianjin Univ. (China) and Capital Normal Univ. (China); F. Dong, Y. Xu, Z. Zhang, Tianjin Univ. (China)</td>
</tr>
<tr>
<td>7127 1W</td>
<td>Modeling and simulation of hydraulic vibration system based on bond graph and Matlab/Simulink</td>
<td>H. Lian, Z. Kou, Taiyuan Univ. of Technology (China) and Shanxi Province Mine Fluid Control Engineering Research Ctr. (China)</td>
</tr>
<tr>
<td>7127 1X</td>
<td>Near optimal antenna selection algorithm for MIMO systems under spatial correlated fading</td>
<td>Z. Xie, J. Wang, Y. Wang, J. Gao, D. Yan, Northeastern Univ. (China)</td>
</tr>
<tr>
<td>7127 1Y</td>
<td>A preconditioned hybrid reconstruction algorithm for electrical impedance tomography</td>
<td>W. Fan, H. Wang, Tianjin Univ. (China)</td>
</tr>
<tr>
<td>7127 1Z</td>
<td>The simulation research on hyperthermia temperature of the bladder tumor controlled by grey forecasting</td>
<td>J. Wu, J. Zhu, He’nan Univ. of Science and Technology (China); Z. Wang, Beijing Univ. of Aeronautics and Astronautics (China); X. Zhang, He’nan Univ. of Science and Technology (China)</td>
</tr>
<tr>
<td>7127 20</td>
<td>A new peak-to-average power ratio reduction algorithm for OFDM systems via discrete particle swarm optimization</td>
<td>J. Gao, J. Wang, Z. Xie, D. Yan, Northeastern Univ. (China)</td>
</tr>
<tr>
<td>7127 21</td>
<td>Novel ellipse extraction method based on edge segments</td>
<td>F. Zhou, J. Cheng, BeiHang Univ. (China)</td>
</tr>
<tr>
<td>7127 22</td>
<td>Modeling of piezoelectric and adaptive modal control for intelligent plates</td>
<td>J. Yao, J. Jiang, BeiHang Univ. (China)</td>
</tr>
<tr>
<td>7127 23</td>
<td>A multifunction current-mode active-c filter employing MO-CCCIIs</td>
<td>W. Ma, J. Jiang, J. Liu, Wuhan Univ. (China)</td>
</tr>
</tbody>
</table>
Effects of quick thermal oxidation annealing on structure of vanadium oxide thin films by direct current facing targets reactive magnetron sputtering [7127-75]
J. Liang, M. Hu, Z. Liu, Tianjin Univ. (China)

Performance evaluation for hyperspectral target detection algorithms [7127-76]
X. Sun, N. Li, H. Zhao, Beihang Univ. (China)

A new spectral unmixing algorithm based on spectral information divergence [7127-77]
Z. Xu, H. Zhao, Beijing Univ. of Aeronautics and Astronautics (China)

Human gait recognition based on compactness [7127-78]
F. Chen, J. Jiang, G. Zhang, BeiHang Univ. (China)

Implementation and performance results of neural network for power quality event detection [7127-79]
W. Huang, Hebei Univ. of Engineering (China); W. Tian, Tangshan College (China)

An approach to unsupervised hair removal from skin melanoma image [7127-80]
F. Xie, S. Qin, Z. Jiang, BeiHang Univ. (China); R. Meng, General Hospital of the Air Force, PLA (China); B. Xu, BeiHang Univ. (China)

Multi-pose ear recognition using locally linear embedding and nearest feature line [7127-81]
Z. Xie, Z. Mu, Univ. of Science and Technology Beijing (China); D. Sun, D. Hu, North China Univ. of Technology (China)

Modeling and simulation of Star Guidance System based on RT-LAB [7127-82]
Y. Shi, Y. Zhao, Beihang Univ. (China); N. Deng, 17th Institute of China Aerospace Science & Industry Corp. (China); L. Du, BeiHang Univ. (China)

Building method of diagnostic model of Bayesian networks based on fault tree [7127-83]
X. Liu, YanTai Univ. (China); H. Li, L. Li, Naval Aeronautical Engineering Institute (China)

Computer-simulated development process of Chinese characters font cognition [7127-84]
J. Chen, Z. Mu, Univ. of Science and Technology Beijing (China); D. Sun, D. Hu, North China Univ. of Technology (China)

Ear recognition based on force field feature extraction and convergence feature extraction [7127-85]
J. Luo, Z. Mu, Y. Wang, Univ. of Science and Technology Beijing (China)

An optimization algorithm of neural network for wood physical property modeling [7127-86]
M. Li, J. Zhang, R. Guo, H. Su, Northeast Forestry Univ. (China)

Wave field separation of seismic data based on least square fitting [7127-87]
H. Wang, China Earthquake Administration (China)

Preprocessing and analysis of the ECG signals [7127-88]
J. Zhu, X. Zhang, He’nan Univ. of Science and Technology (China); Z. Wang, Beijing Univ. of Aeronautics and Astronautics (China); X. Wang, He’nan Univ. of Science and Technology (China)
Feature fusion in multimodal recognition based on ear and profile face [7127-89]
X. Pan, X. Xu, Y. Lu, Y. Cao, Central Univ. for Nationalities (China)

Fast detection and localization algorithm for circular targets [7127-90]
X. Li, Beijing Univ. of Aeronautics and Astronautics (China); X. Wang, Tsinghua Univ. (China); H. Zhao, Beijing Univ. of Aeronautics and Astronautics (China)

A survey of modeling methods for analog circuit testability analysis [7127-91]
X. Chen, Beihang Univ. (China) and North China Electric Power Univ. (China); X. Meng, B. Zhong, H. Ji, Beihang Univ. (China)

A new approach to robust blind restoration of motion blurred images with high fidelity [7127-92]
Y. Liu, S. Qin, Beihang Univ. (China)

A synthetic method for image contour distortion correction [7127-93]
R. Wang, J. Zhang, M. Wang, Beijing Univ. of Aeronautics and Astronautics (China)

Microwave fiber delay line performance simulation research [7127-94]
X. Zhang, Beijing Univ. of Aeronautics and Astronautics (China) and Beijing Institute of Machinery (China); C. Zhang, S. Hu, P. Ou, L. Wei, Beijing Univ. of Aeronautics and Astronautics (China)

The study on the friction pressure drop rate of moist air transferring in pipes [7127-95]
W. Zhang, X. Meng, S. Bai, Beijing Univ. of Aeronautics and Astronautics (China)

A generic performance bound for node localization of wireless sensor networks [7127-96]
R. Feng, J. Wan, N. Yu, W. Ma, Beihang Univ. (China)

A novel data-sending algorithm based on cluster for wireless sensor networks [7127-97]
X. Xu, Beijing Univ. of Posts and Telecommunications (China); R. Feng, J. Wan, Beihang Univ. (China)

A new strategy for robot path planning based on the finite element method [7127-98]
Z. Cao, Beijing Univ. of Aeronautics and Astronautics (China); Q. Meng, H. Wang, Tianjin Univ. (China); L. Xu, Beijing Univ. of Aeronautics and Astronautics (China)

Finite element analysis on signal transmission magnetic core based on ANSYS [7127-99]
T. Wang, J. Zhao, X. Yang, Beijing Univ. of Aeronautics and Astronautics (China)

Author Index
Conference Committees

General Chair

Guofan Jin, Tsinghua University (China) and Chinese Academy of Engineering (China)

Co-General Chair

Richard Holdaway, Rutherford Appleton Laboratory (United Kingdom)
Zhonghua Zhang, Chinese Academy of Engineering (China)

Advisory Committee Members

Chunbo Feng, Chinese Academy of Sciences (China)
Peide Feng, Chinese Academy of Engineering (China)
Lin Huang, Chinese Academy of Sciences (China)
Bohu Li, Chinese Academy of Engineering (China)
Deren Li, Chinese Academy of Sciences (China)
Jingnan Liu, Chinese Academy of Engineering (China)
Zicai Wang, Chinese Academy of Sciences (China)
Hongxin Wu, Chinese Academy of Sciences (China)
Houze Xu, Chinese Academy of Sciences (China)
Jun’en Yao, Chinese Academy of Engineering (China)
Shenghua Ye, Chinese Academy of Sciences (China)

Organizing Committee Chairs

Jiancheng Fang, Beijing University of Aeronautics and Astronautics (China)

Organizing Committee Cochairs

Yuzhen Sun, Beijing University of Aeronautics and Astronautics (China)
Hong Wang, Manchester University (United Kingdom)
Zhongyu Wang, Beijing University of Aeronautics and Astronautics (China)
Organizing Committee Members

Chao Bei, China Aerospace Science & Industry Corporation (China)
Shangchun Fan, Beijing University of Aeronautics and Astronautics (China)
Xinpin Guan, Yanshan University (China)
Lei Guo, Beijing University of Aeronautics and Astronautics (China)
Bin Jiang, Nanjing University of Aeronautics and Astronautics (China)
Chengliang Liu, Shanghai Jiaotong University (China)
Zhang Ren, Beijing University of Aeronautics and Astronautics (China)
Guoqiang Ni, Beijing Institute of Technology (China)
Rong Shu, Chinese Academy of Sciences (China)
Chanyin Sun, National Natural Science Foundation of China (China)
Fuchun Sun, Tsinghua University (China)
Yueqiang Sun, Chinese Academy of Sciences (China)
Rao Tao, Beijing Institute of Technology (China)
Wen Xiao, Beijing University of Aeronautics and Astronautics (China)
Lijun Xu, Beijing University of Aeronautics and Astronautics (China)
Zhihai Xu, Zhejiang University (China)
Jianying Yang, Beijing University (China)
Chunxi Zhang, Beijing University of Aeronautics and Astronautics (China)
Huijie Zhao, Beijing University of Aeronautics and Astronautics (China)
Maiying Zhong, Shandong University (China)

Program Committee Chair

Peide Feng, Chinese Academy of Engineering (China)

Program Committee Members

Roger L. Davies, University of Oxford (United Kingdom)
Brian Culshaw, University of Strathclyde (United Kingdom)
Shuzhi S. Ge, National University of Singapore (Singapore)
Horst Grostollen, University of Paderborn (Germany)
Nick Waltham, Ral Space Science Technology (United Kingdom)
Junqin Huang, Beijing University of Aeronautics and Astronautics (China)
Zongxia Jiao, Beijing University of Aeronautics and Astronautics (China)
Wei Jin, City University of Hong Kong (China)
Jang Gyu Lee, Seoul National University (Republic of Korea)
Qingxiang Li, Tsinghua University (China)
Fangyu Liao, China Academy of Space Technology (China)
Zongli Lin, Virginia University (USA)
Jianye Liu, Nanjing University of Aeronautics and Astronautics (China)
Jun Ni, University of Michigan (USA)
Mitsuo Ohta, Hiroshima University (Japan)
Yoshihisa Uchida, Aichi Institute of Technology (Japan)
Boxiong Wang, Tsinghua University (China)
Jiaxu Wang, Chongqing University (China)
Xin Xin, Okayama Prefectural University (Japan)
Guangjun Zhang, Beijing University of Aeronautics and Astronautics (China)
Zhaotian Zhang, National Natural Science Foundation of China (China)
John Zecknecky, Open University (United Kingdom)
Yicheng Wang, National Institute of Standards and Technology (USA)
James Whetstone, National Institute of Standards and Technology (USA)
Kang Lee, National Institute of Standards and Technology (USA)
Yong Yan, University of Kent (United Kingdom)

Plenary Session Chairs
Lei Guo, Beijing University of Aeronautics and Astronautics (China)
Shiji Song, Tsinghua University (China)

Special Sessions Chairs
Lijun Xu, Beijing University of Aeronautics and Astronautics (China)
Zhihai Xu, Zhejiang University (China)

Publications Chair
Zhaoehua Yang, Beijing University of Aeronautics and Astronautics (China)

Publicity Chairs
Zhong Wu, Beijing University of Aeronautics and Astronautics (China)
Dong Xu, Beijing University of Aeronautics and Astronautics (China)