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Overview of the International Conference on Applied Physics, Information Technologies and Engineering – APITECH - 2019

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Abstract. The overview describes the main directions and results of the International Conference APITECH-2019 held in Krasnoyarsk in September 25-27, 2019. It gives the details about the participants and the proceedings.

The Volume contains Proceedings of the International Conference on Applied Physics, Information Technologies and Engineering (APITECH-2019) which was held at the Krasnoyarsk Science and Technology City Hall in Krasnoyarsk, Russian Federation in September 25-27, 2019. Additionally, the volume includes the best reports accepted and presented at the 2-nd International Scientific and Practical Conference “Borisov’s Readings”, which took place at the Polytechnical Institute of the Siberian Federal University in September 25-27, 2019.

The purpose of these scientific events is to share the results and prospects of the achievements in fields of application of modern methods of applied physics and information technologies in high-tech production, in aerospace, energy, chemical, oil and gas engineering industries, in economics and organization of engineering production; and in modern areas of research of complex technical and information systems.

The 2-nd Borisov’s Readings - 2019 provided an international forum for the presentation of original results in mathematical modelling for software- and hardware applications in various fields of modern problems of mechanical and power engineering, transport machines, industrial robots and robotic systems, etc.

The International Conference on Applied Physics, Information Technologies and Engineering (APITECH-2019) was jointly organised by the International and Russian Union of Scientific and Engineering Associations (Moscow, Russia), Krasnoyarsk Scientific Centre of the Siberian Branch of the Russian Academy of Sciences and Krasnoyarsk Science and Technology City Hall.

The main partner organisations in preparing and organising the Conference in Krasnoyarsk as well as of the previous scientific events [1-3] were: JSC “Central Construction Bureau “Geophysics”, JSC “ISS-Reshetnev Company”, Siberian Federal University, Institute of Informatics and Telecommunications of Reshetnev University.

The program of the Conference consisted of keynote and plenary talks and numerous presentations (figure 1).





Figure 1. Plenary talks and sections.

The Program Committee and Editorial Board included prominent professors and scientists from the Russian Academy of Sciences, Czech Technical University in Prague, University of Maribor (Slovenia), Tashkent University of Information Technologies (Uzbekistan), Baku State University (Azerbaijan), Ruhr University in Bochum (Germany), Siberian Federal University (Russia), Reshetnev Siberian State University of Science and Technology (Russia), Voronezh State Technical University (Russia) as well as specialists from Russian and foreign leading industrial enterprises.

The international scope of the Conference was confirmed by the participation of representatives from 14 countries besides Russia (Azerbaijan, Ukraine, Nigeria, Germany, USA, Kazakhstan, Vietnam, Pakistan, Saudi Arabia, China, Egypt, Uzbekistan, etc).

The participants from Russia represented more than 160 universities, scientific institutes and organisations, industrial enterprises from more than 40 regions of the Russian Federation.

The event has offered a platform for bringing together students, postdocs, innovative academics and industrial experts to exchange their ideas and contribute new applied physics and engineering approaches to research mechanical and automation processes in various technological and information systems. Great interest was aroused by the section about applied physics, cybernetics and information technologies, engineering and mechanical science. These directions stimulated lively discussions among researchers as well as industrialists.

The Conference provided the premier interdisciplinary and multidisciplinary forum for researchers, practitioners and educators to present and discuss the most recent innovations, trends, concerns, practical challenges encountered and the solutions adopted in the fields of industrial physics, materials sciences, mechanical and aerospace engineering, information and transport technologies, robotics and cybernetics, data protection in automation systems, chemical, ecological and power engineering, etc.

Although the schedule of the Conference was very tight, there were very vivid discussions among the participants. The participants who could not come to the Conference due to different reasons including the problem of high transportation costs presented on-site presentations which are available on the web-site of the Conference.

A wide range of engineering and industrial physics problems in various production and technological systems has undergone consideration during the meeting. The programme of the Conference included the following scientific directions:

- Condensed Matter Physics;
- Nanoscience and Nanotechnology;
- Optical Physics, Quantum Electronics and Photonics;
- Engineering and Industrial Physics;
- Instrumentation Metrology and Standards;
- Software Engineering;
- Information Systems;
- Software Reliability and Data Protection;
- Cybernetics, Economics and Organization of Mechanical Engineering Production;
- Mechanical Engineering and Industry 4.0;
- Materials Science, Aerospace Technology and Engineering;
- Power, Chemical and Ecological Engineering;
- Oil and Gas Engineering.

All participants were invited to present their papers in this Volume and all submitted manuscripts went through the independent peer review process. We are very grateful to all reviewers from Russia, China, USA, Slovenia, Germany and Republic of Kazakhstan for their time and highly professional comments. We deeply believe that their reviews gave opportunity to improve the scientific quality of the presented papers which may be useful for academic, scientific and industrial partners.

More than 700 reports were submitted to the Organizing Committee of the Conferences APITECH-2019 and 2-nd Borisov' Readings 2019. 405 reports were selected for inclusion into this Volume after the review process. All the papers were subjected to rigorous peer-review by conference committee members and international reviewers. The papers were selected based on their quality and relevance to the Conference directions. The proceedings present to the readers the recent advances in the field of applied physics (section 1), cybernetics and IT (section 2), engineering and material science (section 3), instrumentation technology and environmental engineering (section 4). These papers reflect modern industrial physics and engineering approaches in all Conference directions.

We chose the IOP Journal of Physics: Conference Series to provide all contributors with the opportunity to publish their papers in an international, peer-reviewed journal. This is understood and appreciated by all the participants of our Conference, and therefore this Volume provides an excellent overview of the main topics of our Conference.

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We express our gratitude to Professor Vasily Pantelev who was the chair of the Programme Committee of 2-nd Borisov' Readings 2019 for the organization of this Conference at the Siberian Federal University and cooperation in organization of APITECH-2019. We are grateful to scientists and professors of Siberian Federal University, Saint Petersburg State University of Aerospace

Instrumentation, Institute of Computational Modeling of Siberian Branch of Russian Academy of Sciences and Reshetnev Siberian State University for active participation in the Conference.

On behalf of the conference committee and organizers, we would like to thank all the authors who contributed to this Volume as well as to the reviewers, speakers and all the conference participants for their support to APITECH-2019.

We express gratitude to IOP Publishing for an opportunity to publish the Proceedings of the Conference to provide open access and to make them available for worldwide recognition.

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