## **CSIT'2016**

Proceedings of the 18th International Workshop on

# **Computer Science and Information Technologies**

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Volume 1

The International Workshop on Computer Science and Information Technologies

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The Workshop on Computer Science and Information Technologies (CSIT) is an annual international conference providing a forum for exchange of scientific achievements between research communities of Eastern Europe and the rest of the world in the area of computer science and information technologies. *The 18<sup>th</sup> International Workshop on Computer Science and Information Technologies* (18<sup>th</sup>CSIT'2016) was aimed at bringing together researchers, practitioners, developers, and users to explore new concepts, tools and techniques for advanced information technologies. The papers are included as they are submitted by the authors, without editing.

#### The International Workshop on Computer Science and Information Technologies

Organized by
Ufa State Aviation Technical University, Ufa, Russia

In collaboration with

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Hungarian Academy of Sciences, Budapest, Hungary
European Polytechnical Institute Kunovice, Czech Republic

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#### **Foreword**

These Proceedings contain the full texts of the papers, selected for presentation at the 17th International Workshop on Computer Science and Information Technologies (CSIT'2016). The previous sixteen Workshops on Computer Science and Information Technologies (CSIT) were organized in Moscow (1999), Ufa (2000, 2001, 2003, 2005, 2007), Patras, Greece (2002), Budapest, Hungary (2004), Karlsruhe, Germany (2006), Antalya, Turkey (2008), Crete, Greece (2009), Moscow-Saint-Petersburg, Russia (2010), Garmisch-Partenkirchen, Germany (2011), Ufa - Hamburg - Norwegian Fjords (2012), Vienna-Budapest-Bratislava (2013), Sheffield, England (2014), Rome, Italy (2015). The Workshop's aim is bringing together researchers from different areas, including Distributed Information Systems, Data&Knowledge Management, Computer Control, IT Applications. These areas are heavily related nowadays.

The Workshop attracted more than two hundred submitted technical papers from different countries including both conceptual and experience papers. Both types of submissions were evaluated similarly, in accordance with standards of international forums. The careful reviewing procedure by the program committee resulted in 34 papers being chosen for the presentation in the international track (Volume 1). The next sections - Information and Enterprise Resource Planning Systems; Control and IT in Technical Systems; Mathematical Models, Algorithms and Simulation; IT in Social, Economic Modeling and Educational Systems; Researches of young scientists - appear to be gaining attention. Some of the experience papers, especially at the industrial sessions, reflect the results in development/application of real systems, and were considered by the program committee to be of interest to a wider community.

The Program Committee would like to extend appreciation to all those who submitted the preliminary versions of the papers or extended abstracts for international peer reviewing.

Our thanks go to all the attendees of the Workshop here in Czech Republic, Prague, Kunovice that boosted the research activity in the Computer Science and Information Technologies areas.

Organising Committee of CSIT'2016 are grateful for the support and collaboration Mgr. Majičková Ivana, mayor of Kunovice, Melyuhov O.F., chairman of the Board of Directors «Aircraft Industries a.s.» and prof. Oldřich Kratochvíl, rector of the European Polytechnic Institute Kunovice, Czech Republic.

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