Special Issue on the Future Internet –
Guest Editorial

Gyula Sallai, Wolfgang Schreiner, and János Sztrik

Recent dramatic changes such as the rising number of Internet users, the penetration of portable and mobile devices, or the Internet of Things, has motivated a number of research initiatives, labeled "Future Internet" worldwide, supported by NSF in the USA and EU research framework programs in Europe. In Hungary, the ongoing "Future Internet Research, Services and Technology – FIRST" project, supported by the European Social Funds focuses on key theoretical, modeling, planning, application and experimental aspects of Future Internet. The six papers published in this special issue demonstrate the research results achieved by the FIRST research community in various fields related to Future Internet.

Since the standardization of the TCP/IP 40 years ago, TCP is, after several modifications, still the protocol providing reliable end-to-end transport on the Internet. The first paper, "Towards the Transport Protocols of Future Internet", by *Z. Móczár and S. Molnár,* presents the evolution of transport protocols since the early days of the Internet, gives an overview of the main pitfalls the researchers faced with during the years, and suggests a promising approach which may be able to satisfy the diverse requirements of future networks.

The Internet Protocol by its nature does not guarantee the delivery of packets in the right order. Therefore, it is important to investigate the effects of packet reordering. Authors *A. Kuki, B. Almási, T. Bérczes and J. Sztrik,* in their paper "Modeling a QoS Classified Communication in a multiuser Wi-Fi Environment", propose a finite source queueing model that includes the packet reordering feature. The authors show how the packet reordering phenomenon influences the main waiting times compared to the FIFO discipline.

In next generation wireless telecommunications networks not only the movements of single mobile endpoints but also entire mobile network movements need to be managed (network mobility or NEMO). The paper "A study on the Performance of an Advanced Framework for Prediction-based NEMO Handovers in Multihomed Scenarios", by *L. Bokor, G. Jeney, J. Kovács,* pro-vides an extensive performance evaluation of an advanced handover management solution that aims at providing ubiquitous IPv6 connection and seamless Internet access for NEMO scenarios.

Despite the reliability feature of TCP, its relatively high complexity does not always enable to implement it in a hardware environment with constrained resources. The paper by *P. Orosz, T. Skopkó, and M. Varga,* titled "RCTP: A Low-complexity Transport Protocol for Collecting Measurement Data", introduces a low-complexity transport protocol dedicated to a real-time network monitoring system operating above 10 Gbps. The protocol may be suitable for measurement networks such as sensor networks.

The fifth paper ot this special issue, "Internet of Things: application areas and research results of the FIRST project", by *Z. Gál, B. Almási, S. Oniga, S. Baran, T. Dabóczi, R. Vida, and I. Farkas,* gives an overview of the research results achieved within the FIRST/IoT Project. The paper deals with the following six topics:

i) Integration of the IoT into the IPv4/IPv6 systems
ii) Cyber physical systems
iii) Self-optimizing and self-managing communication mechanisms of the IoT systems
iv) E-health powered by IoT
v) Weather prediction network tool development and analysis
vi) Development of testbeds and virtual service platforms

The last paper deals with the interesting phenomena on social network that has been in the focus of research during the past two decades or so. The authors, *G. Kocsis and I. Varga,* in their paper "Investigation of spreading phenomena on social networks", studied information spreading on different network topologies. Based on a novel complex network generating method several test cases were created for social simulations, focusing mainly on the case of declining social networks.

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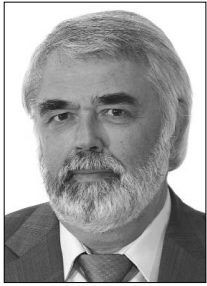
GYULA SALLAI received MSc degree from the Budapest University of Technology and Economics (BME), PhD and DSc degrees from the Hungarian Academy of Sciences (MTA), all in telecommunications. He was senior researcher in telecommunication network planning, then research director, strategic director, later deputy CEO with the Hungarian Telecom Company; then international vice president, after that executive vice president for the ICT regulation with the Communication Authority of Hungary. From 2002 to 2010 he was the head of the Department of Telecommunications and Media Informatics of the BME, and from 2004 to 2008 the vice-rector of the BME as well. From 2005 to 2011 he was also the chairman of the Telecommunication Committee of the MTA and the president of the Hungarian Scientific Association for Infocommunications (HTE).
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