

Guest Editorial

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This Special Issue is devoted to the 60th anniversary of the establishment of our two predecessor departments, the Department of Wireline Communications and the Department of Wireless Communications. Since 1949 not only the organization structure and the name of departments in this area of our university has changed several times but we have been witnessing several dramatic changes, even paradigm shifts in communication technologies, telecommunications and broadcasting. It is sufficient to mention that there was no Internet at that time (another round figure this year: we are celebrating the 40th anniversary of the birth of the Internet as a packet switched wide area computer network). To follow these developments, the activities and profiles of the two departments underwent corresponding changes until today when the convergence of these areas has almost fully come true.

The objective of this special issue is to highlight a few topics by invited overview papers that are representative samples from the wide scale of research activities of the two present departments: the Dept. of Telecommunications (HIT) and the Dept. of Telecommunications and Media Informatics (TMIT).

The first paper titled „On the security of communication network: now and tomorrow” by *Boldizsár Bencsáth, Levente Buttyán and István Vajda* of Crysys Lab (*Laboratory of Cryptography and Systems Security, HIT*) discusses some security issues in the Internet and sketches future research directions in this field. In particular, the authors discuss the security issues in wireless networked embedded systems through three examples: sensor networks, vehicular communications, and RFID systems. Finally a brief introduction is given to the field of network coding, which is a new and promising research area in networking.

Speech technology has been an area of intensive research worldwide – including Hungary – for several decades and the *Laboratory of Speech Technology of TMIT* has been in the forefront of this research. The paper by *Géza Németh, Gábor Olaszy, Klára Vicsi and Tibor Fegyó* „Talking machines?! Present and future of speech technology in Hungary” gives an overview of the challenges and results of the domain and the vision of the development and the application of the technology will also be introduced.

The next paper „Congestion control and network management in Future Internet” by *Márton Csernai, András Gulyás, Zalán Heszberger, Sándor Molnár and Balázs Sonkoly* addresses two key issues in the Future Internet research where the general objective is to encourage clean slate designs and thus overcome the barriers of the previously prevailing incremental development, proposing new visions, architectures and paradigms for the coming 10-20 years. The first area is congestion control where recent results show that networks operating without explicit congestion control (like TCP) may survive without congestion collapse if appropriately designed in network resources and if end systems apply appropriate erasure coding schemes. The second topic is related to the exponential growth of the Internet which makes it hardly impossible to manage the network with traditional centralized approaches (like manager-agent); hence research results of complex networks are expected to spread over the Internet with its autonomic behaviors. The authors are pursuing research in these fields within the framework of the *High Speed Networks Laboratory of TMIT*.

The last paper is titled “Media communications over IP networks – An error correction scheme for IPTV environment” by *László Lois, Ákos Sebestyén, Laboratory of Multimedia Networks of HIT*. Video transmission over IP networks has been gaining more and more popularity recently. One of the crucial problems of video transmission over IP networks through unreliable links is the susceptibility to errors in the transmission path. Packets lost or discarded must be somehow regenerated which can be accomplished by requesting a retransmission or by recalculating the packet provided that some redundancy is introduced in the transmitter side. In addition to a general overview of issues around the media transmission over IP networks, the paper describes a novel method that can be used for forward error correction in IPTV applications.

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