

# Booming usage of Infocommunications technologies brought to you by 2020

Pal Varga

**W**HILE the year 2020 was sorrowful in many ways, some of its challenges has been successfully overcome by humanity. Most of these successes have depended on Infocommunications technologies: these allowed us to keep the human interaction flowing during lock-downs. The most visible change was literally the broad usage of multimedia communications. Our communication spaces went "virtual": from schoolrooms through company meetings to massconferences; even the corridor- and coffee-break discussions got some alternatives.

On the other hand, we did not get easy access to laboratory or on-site physical equipment, so instead of building physical demonstrators and proofs, simulations and theoretical work must have received more focus even for those scholars who are used to hands-on experiences. Challenges are good for proceeding further, even if we didn't choose to face such challenges. The ICT sector has received a new boost from the mass home-office working scenarios, virtual conferencing and in general, remote operations. These spins the concept of digital twins and cyber-physical systems further, and fuels various areas from satellite communications to cryptography, from new paradigms in function virtualization to information sharing frameworks in supply chains.

The following paragraphs provide brief overviews of the papers in the current issue of the Infocommunications Journal.

In his paper, our distinguished author, János Ladványszky presented efficient way of noise reduction in the form of a modified Costas loop. The basic version of the Costas loop has been developed for demodulating SSB SC signals – the same circuit is applied for QAM demodulation as well, with decreased noise sensitivity. The two solutions applied in order to reach this is the transformation of the real channel input into complex signal, and the application of our folding algorithm. There are further improvements introduced in this paper, namely the complex channel input signal is normalized, and rotational average is applied. This results that at SNR of 0 dB, the solution provides 100 times better SER than that the original Costas loop does.

Categorizing the words according to their dictionary entry is a complex task even for contemporary text, whereas for less conventional texts (in old or less researched languages) it is even harder to solve this problem automatically. In their paper, Béla Benedek Szakács and Tamás Mészáros created an expert system-based automatic tagger that can be used to pre-process texts for dictionary-expansion. They demonstrated that a threecomponent tool performs better on Mikes Kelemen's writings that are in an archaic dialect of the Hungarian language.

They compared their results to some already existing tools on the same corpus, and also created their own software that helps

in expanding a dictionary containing word forms and tagging unprocessed text. Although this new tool was specifically designed for this task, it can be used in many other applications, and its flexibility allows for processing other noncontemporary or otherwise drastically different dialects.

In their paper, Dávid Haja, Zoltán Richárd Turányi and László Toka proposed a FaaS system design that offers horizontal scaling at the performance promise of host internal operation. Their proposed platform offers scaling to several server machines, when more compute power is needed. Besides, it minimizes the need for remote data access and remote function invocation through intelligent placement of data and function executions. They found that while not all application setups permit the reduction of remote operations under highload, partially because it is not possible to systematically reduce the fraction of remote operations, still, most of the computing problems exhibit clusters of often communicating functions and their data. One of their main points is that these applications run faster in a FaaS platform considering locality.

Dániel Kozma and Pal Varga presented a newly designed development methodology for IoT-based Supply Chain Management (SCM) frameworks and platforms. They examine the main SCM modeling approaches and identify IoT-based frameworks and platforms to support Dynamic Supply Chains. They present an IoT-SCM development methodology, which defines these platforms' characteristics by three main activities, namely the Collaboration, Control and Combination, and their related sub-activities. The methodology has been validated by the SOA-based IoT framework, Arrowhead.

Infocommunications Journal wishes you a Happy New Year with these articles – hope the number 21 will give us a lot more luck (and success) than 20 did.



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