

Recent advances on high performance computing, mobile networking, and security

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WE have reached the end of this turbulent year of 2022. In terms of scientific achievements, it was a successful one for our community: the journal never received so many – close to 150 – individual submissions within a calendar year before. This is certainly due to three factors. The first reason is, of course, the continuously and visibly improving journal metrics. Second, the two calls for special issue papers: on Internet of Digital & Cognitive Realities and on Tech-Augmented Legal Environment. Third, the activities of the Editorial Board, which helped a lot in attracting great papers. As the Infocommunications Journal is listed in the Web of Science: Emerging Sources Citation Index, we became eligible for an official Impact Factor calculated by Clarivate, already for the year 2022 – the actual value will be announced in June 2023. We are very positive that this value will be very attractive, and its announcement in June provides our Journal even better visibility than we have now.

Let us have a brief overview of the articles included in the last issue of the Infocommunications Journal for the year 2022.

In the first paper of this issue, H. Alabbas and Á. Huszák propose a novel gateway selection algorithm for vehicular networks in urban areas. Their method consists of two phases: at first it identifies the best available gateways using multiobjective integer programming, after which it selects the most suitable gateway for the given vehicular nodes, by using reinforcement learning.

Augmented Reality and related technologies are in the focus of attention for many application domains – including healthcare. In his paper, György Wersényi investigates the usability of the HoloLens device for medical applications. He evaluates the HoloLens usage, especially regarding latency and throughput, and finds that at this stage, it is very useful for education, training, or teleassistance, but not yet reliable enough for latency-sensitive tasks.

In their paper, Edson Ramiro Lucas Filho and his coauthors present a comprehensive simulator for distributed and tiered file-based storage system, DITIS. It is able to accurately simulate the distributed file system behaviors, taking into account the performance characteristics of each node. This understanding of the underlying behavior and effects of these systems brings multiple benefits to users – as shown here.

Regarding profiling hierarchical storage, A. Khelili, S. Robert and S. Zertal present FiLiP, which provides statistics and metrics for better understanding the performance behind application file access and file movements across hierarchical storage. The authors highlight the feasibility of FiLiP by demonstrating its results on various I/O-intensive highperformance computing applications.

Adding to hardware performance tweaks, A.D.R. Kulandai and T. Schwarz present a new strategy on how to select memory locations for overwrites that result in a lower number of bit-flips. They apply this method on non-volatile random access memories (NVRAMs), and calculate the expected bitflip savings for the new strategy, so they can determine rules for finding the best

candidate memory locations.

In their paper, K. Venugopalachary, D. Mishra and R. Saini investigate the exact and secrecy outage possibilities of amplify-and-forward cooperative communication systems while passive external monitoring (or eavesdropping) is present. As a result, the authors provide the close-form expressions for probabilities of secrecy outage and secrecy intercept, which are then validated through simulations.

The problem of output load power maximization with optimal load impedances selection for RFID tags is in the focus of the study by A.C.Y. Goay, D. Mishra and A. Seneviratne. They investigate this topic for BER-aware backscatter communication, where the tag uses binary ASK. The proposed design provides a gain of cca. 16%, which is a significant argument in favor of utilizing this method.

Zooming out to communication systems, A. Strzoda, R. Marjasz and K. Grochla evaluate LoRa localization capabilities and data credibility. They found that although trilateration has limited accuracy, the LoRa measurement can still be very well used for evaluating the credibility of the location information.

In their paper, Artur Poplawski and Szymon Szott represent certain cellular network models as graphical games, and use dynamic programming for optimizing it. They demonstrate the idea through the game on interference in the radio access network, and verify the feasibility through simulations.

A review of current activities in European cybersecurity research and innovation is presented by Mehmet Ufuk Caglayan. Among others, it specifically reviews the projects NEMESYS, SDK4ED, KONFIDO, GHOST, SerIoT, IoTAC and their sidelobe research and innovation initiatives.

As the closing paper of this issue, Rixuan Qiu and his coauthors propose a Kformer-based fine-grained dynamic access control method to automate authorization management tasks. The presented experimental results show that KFormer is feasible for the tasks, stable, and has high accuracy.

With this overview, we wish you a great turn of 2022/23, with pleasant reads of the papers of the current issue.



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