

Dear readers,

You are holding the first issue of the *Science & Military* in the fifteenth year of its existence. As the chief editor, I am pleased to say that our journal is attracting more and more readers and authors, which results in higher quality of articles submitted to the editorial board for publication.

Academic writing has become an increasingly important part of scientific work. It is impossible to carry out any research without sharing information and its results. The current trends in academic writing involve particularly new models that emerge in scientific communication and publication. They are influenced by digital tools, the Open Access Movement and the open science concept.

Academic writing significantly increases human knowledge. It is an important part of doctoral studies and it helps senior researchers gain prestige in academic circles and promote their research.

Dear readers, let me briefly introduce the latest issue of the *Science & Military* 1/2020, which contains interesting articles that underwent a rigorous review process.

The first among the peer-reviewed articles in this issue is the article written by Jozef Kostelanský and Lubomír Dederá titled „**Evaluation of Custom Virtual Machine Instruction Set Emulator**“. The main goal of the article is to evaluate performance characteristics of a custom virtual machine instruction set emulator. The authors compare performance characteristics of two implementations of the CRC16 algorithm – in the emulated custom virtual machine instruction set and the direct C-to-x86-compiled executable.

Another article titled “**Simulation Analysis of Planetary Transmissions in MATLAB Environment**“ was written by Matúš Riečičiar and Peter Droppa. This paper deals with verification of the Simscape driveline module of the Matlab software as a tool of vehicle transmission and driveline designing. The authors compare different parameters results of analytical computing and Simscape simulations output values.

The authors Hung Nguyen Manh, Marie Richterová and Tomáš Břinčil wrote the article titled „**Performance Evaluation of Downlink Satellite Broadcast Stream Under Rainy Conditions in a Laboratory – Controlled Environment**“. This article analyses the basic technical properties and principles of the DVB-S2 system and the performance of the BER system under rainy conditions simulated by air in a room with an anechoic chamber. The results are analysed and used to design future research to determine the optimal coding rates and

modulation schemes as well as their impact on the entire signal transmission.

The author Anton Mydliar wrote the article titled “**Optimization of Ultrasonic Cutting Tool Geometry**“. This paper is concerned with the optimization of the ultrasonic cutting tool geometry. The author made the parameterizable model of Ultrasonic Cutting tool, which was created in finite element software Ansys. The eigen frequencies and modal shapes were extracted by modal analysis. The results and measurements are summarized in the conclusion of the article.

Another article titled “**Formal Model of Decomposition and Mapping in Accelerated Cluster Architecture**“ was written by Miloš Očkay and Lubomír Dederá. It outlines basic elements of accelerated cluster architecture. It also explains decomposition and mapping in multistage architecture, using the data and task parallelism. The presented formal model describes decomposition in all stages, allowing more efficient mapping and achieving an accelerated solution to a complex problem.

The authors Martin Droppa and Marcel Harakal' wrote the article titled “**Cyber Security State in Real Environment**“. The purpose of this document is to give an insight into the wide area of world of cyber security and state of the cyber security in AFA (Armed Forces Academy in Liptovský Mikuláš) environment. In the end of the article, the findings from the state of cyber security at AFA are described. Based on a simple analysis of the situation in the AFA environment, the proposed recommendations, measures and methods of eliminating cyber attacks are briefly described.

The series of articles is closed with the paper titled “**Fundamentals of Static Malware Analysis: Principles, Methods and Tools**“ written by Andrej Fedák and Jozef Štulrajter. One of the goals of this paper is to make readers familiar with the malware analysis, specifically with the complex subject such as static analysis. This includes clarifying what the analysis is and what it is used for. Another contribution of this paper is further description of these analytical tools and methods.

Dear readers, these are the articles, which have been selected for our first issue in 2020. We hope you will find them interesting and that they will motivate and inspire you to create new opinions, conduct research or react by writing new papers.

Col. (ret.) Prof. Eng. Marcel HARAKAL, PhD.
Chairman of the editorial board