

## Editorial Foreword

Modern technologies that based on advanced hardware and software and reflect the latest applied research are extremely important for any modern society and its development. They are applied across the entire theoretical research and in technological applications. Lately, one could observe that advanced engineering applications are often subject of hybridization with unconventional algorithms and discoveries from the computer science, thus enhancing the performance and usability. Consequently, all those modern advanced engineering technologies have become a vitally important part of science and engineering both at the theoretical and the practical level of research. The most interesting and applicable notions include chaos control and chaos synchronization related to the secure communications, evolutionary algorithms and complex system control and design, applications in control engineering and in designing various devices and its functionality with a wide applicability on many industrial issues among others.

Recently, the engineering applications have not focused only on the traditional trends but also on the understanding and analyzing of the principles. The new focus is also on mutual intersections of individual interesting fields of research. The first JAEC issue discusses an intersection of interesting fields of research, such as for example the extended Kalman filtering for estimating immeasurable vehicle state variables, an effective approach of approximation of fractional order system, adaptive MIMO controller design for chaos synchronization in Josephson junction via fuzzy neural networks, interdisciplinary oriented papers on bio inspired algorithms, complex networks and chaos. Moreover, the papers on databases or monitoring and analysis of network technologies that handle throughputs or up to 100Gbps, transporting 200 million packets per second on a single link are presented in this issue. The issue consists of eight original research papers that summarize the recent original research intersections of the fields that can be classified as the advanced engineering applications.

It is obvious that due to the limited space, this issue does not encompass all aspects of individual topics. Only the main ideas and results of selected papers are presented here. The authors and editors hope that the readers will be inspired to do their own experiments and simulations, based on information provided in this issue, thereby moving beyond the scope of it. For these reasons, we believe that this issue will be useful for scientists and engineers working in the above-mentioned fields of research and applications.

We would like to thank the journal editorial board for their interest and full support in this issue's organization. Many thanks also belong to Ton Duc Thang University for its highly professional, precise and quick production process. Without all of this, it would be impossible to organize the first successful JAEC issue dedicated to this interesting topic.

Prof. Václav Snášel  
Chairman of the Editorial Board

