FOREWORD

Dear readers and colleagues,

recent advances in engineering and computers sciences opened new horizons for interdisciplinary research. The cooperation of experts from engineering and life sciences has already proven to be very beneficial and several important achievements are pushing area of biomedical research forward. Some of the biomedical systems and application have already found applications others are under development showing huge potential for the future. This special issue presents several contributions from different areas of biomedical research and provide indication of recent advances in biomedical engineering.

First paper investigate influence of extremely low frequency electromagnetic fields emanating from high voltage transmission lines on human body. Authors present analytical model of human body and magnetic field that allows to derive values of internally induced electric field and current density in human body.

Another paper presents the Matlab tool for hearth rate analysis. The tool offers wide variety of methods including time-domain analysis, methods of nonlinear and symbolic analysis and methods based on the time irreversibility. Authors propose potential application for non-invasive measurement of the autonomic nervous system and variability of the hearth rate.

Third paper focus on hardware design for biomedical applications. Particularly, authors describe design of four-channel amplifier for human neurophysiologic electrical activity measurement. This is another contribution to ultimate goal of building medically acceptable brain-computer interfaces.

In the last paper of this special issue authors review eight frequently used machine learning classifiers and analyze their performance in terms of classification accuracy and Mathews correlation coefficient. This analysis is useful for any researcher facing disease classification problem using machine learning tools or designing decision support system. The study covers wide range of classifiers starting with simple classifiers such as linear discriminant analysis and perceptron classifier and ending with complex classifiers such deep belief networks or popular support vector machine.

Peter Drotár
Guest Editor