

EDITORIAL

Dear reader,

You have at your desk the issue no. 3/2014 of the journal AUTOMATIKA, which contains 14 original scientific papers in the fields of computing, control systems, mobile robotics, power electronics, digital signal processing and communications.

In the first paper, **Model-Based Power Plant Master Control**, Jean Thomas develops a coordinated master control for a solid fuel power plant based on model predictive control. The method is evaluated on a nonlinear process model of a power plant in Nyköping, Sweden. The following paper entitled **Soft Switched Voltage Multiplier Cell based DC-DC Converter for Automotive Applications** by Prabhakar Mahalingam proposes a soft switched voltage multiplier cell that provides the required high voltage gain without using a transformer. Experimental results presented with respect to efficiency and load regulation. In the third paper, **Digital Position Control Strategy of Traveling-wave Ultrasonic Motors**, Hieu To Nguyen et al. propose a digital control algorithm for position control of motors to shorten the long control period so as to maintain the stability of the motor performance. The authors test in experiments the effectiveness and reliability of the proposed digital controller. In the following paper, **Analysis of Automobile Starter Solenoid Switch for Improved Life**, V. M. Murugesan et al. present an experimental study of simple geometries representing the electrical contact in automotive connectors when current passes through them. The paper aims to provide recommendations in finding a compromise between the electrical and mechanical aspects for a power connector. Aleš Hace and Marko Franc propose in their paper entitled **Enhanced Pseudo-sensorless Bilateral Teleoperation by PLL $\alpha\beta$ -tracker and FPGA** a Phase Locked Loop $\alpha\beta$ -tracker that presents an improved approach for position and velocity estimation. The proposed approach is experimentally validated on a 1-DoF laboratory bilateral teleoperation system. The paper entitled **Multi-Robot Cooperation for Efficient Exploration** by Andreas Nuechter and Mohammad Al khawaldah addresses the problem of exploration of an unknown environment by developing exploration strategies for a team of mobile robots equipped with continuously rotating 3D scanners. The experiments were conducted in environments where obstacles are distributed according to the Hilbert curve. In the fifth paper, **Coordinated Path Following for Mobile Robots Using a Virtual Structure Strategy with Model Predictive Control**, Kiattisin Kanjanawanishkul proposes a novel coordinated path following controller based on model predictive control for mobile robots. Simulation scenarios have been conducted to illustrate performance of the method for a small group of mobile robots. The sixth paper entitled **Performance Analysis of Selecting Maximal Ratio Combining Hybrid Diversity System over Ricean Fading Channels** by Petar Spalevic et al. presents an approach to the performance analysis of hybrid Selection Maximal Ratio Combining diversity system operating over Ricean fading channels. Furthermore, closed form expressions are provided for standard first and second order statistical measures for the signal at the output of the combiner. The seventh paper entitled **Transient Behaviour of Grounding System in a Two-Layer Soil Using the Transmission Line Theory** by Daoud Sekki et al. model the transient behavior of grounding systems in the presence of layered media, which accounts for the influence of semi-infinite media (soil or air) and imposes conditions at the interfaces. The following paper entitled **Location Optimization of WLAN Access Points Based on a Neural Network Model and Evolutionary Algorithms** by Ivan Vilović and Nikša Burum uses evolutionary computation techniques—Particle Swarm Optimization and Ant

*Colony Optimization—in an indoor propagation problem and compares their performance to the genetic algorithm which is used as a reference. The paper entitled **Analytical Fault Detection and Isolation Algorithms Based on Rotation Matrices for a Three Axis Stabilized Satellite** by Saeed Nasrollahi et al. presents fault detection and isolation algorithms for attitude determination system of a satellite including a sun sensor and a magnetometer. The performance and accuracy of the methods is demonstrated in multiple simulation studies. In the following paper, **Analog Circuit Fault Detection Using Relative Amplitude and Relative Phase Analysis**, Lan Ma et al. propose a new method for detection of parametric faults occurring in analog circuits based on relative amplitude and relative phase analysis of the Circuit Under Test. The proposed method is tested using HSpice/MATLAB simulations of two benchmark circuits and a practical circuit test of Tow-Thomas circuit. Jonatan Lerga et al. propose in their paper entitled **An ICI Based Algorithm for Fast Denoising of Video Signals** a fast method for video denoising using the modified intersection of confidence intervals rule, whose goal is to maintain an acceptable quality level of the denoised video estimate, and at the same time to significantly reduce denoising execution time when compared to the original method. The final paper entitled **Parallelizing MPEG Decoder with Scalable Streaming Computation Kernels** by Josip Knezović et al. presents a scalable and portable parallelized implementation of an MPEG decoder using a streaming computation paradigm, tailored to new generations of multi-core systems. The performance was examined in the presence of different processor load configurations and with respect to the number of simultaneously processed frames.*

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