

EDITORIAL

Dear reader,

You have at your desk the issue no. 4/2014 of the journal AUTOMATIKA, which contains 14 original scientific papers in the fields of computing, control systems, power electronics, digital signal processing and communications.

In the first paper, **Bayesian Sensor Fusion Methods for Dynamic Object Tracking – A Comparative Study**, Ivan Marković and Ivan Petrović study the problem of Bayesian sensor fusion for dynamic object tracking and analyze the centralised independent likelihood fusion and the hierarchical fusion. The methods are tested on a synthetic data experiments by analyzing the quadratic Rényi entropy and root-mean-square error. The following paper entitled **Simplified Harmonic Model for Full Wave Diode Rectifier Circuits** by Ali Bekir Yildiz and Ezgi Unverdi proposes a simplified equivalent circuit model that can be used in the presentation of characteristic harmonic components generated by full wave diode rectifiers, where model depends on Fourier series expansion for the load voltage and the source current waveforms. In the third paper, **Adaptive Wavelet Neural Network Backstepping Sliding Mode Tracking Control for PMSM Drive System**, Da Liu and Muguo Li present a wavelet neural network backstepping sliding mode controller for permanent-magnet synchronous motor position servo control system. The method is tested in simulations on tracking performance precision and robustness under unknown parameter uncertainties and load disturbance. The paper entitled **Electromagnetic Compatibility in Air Insulation Substation** by Bochra Khelifi et al. analyzes transient coupling between the bus bars of the Air Insulation Substation and the control cable located at its proximity where the study accounts for the real complex geometry of the bus bars and the finite conductivity of the soil. In the following paper, **Direct Active Power Control for Regenerative Cascade Inverter with Reduced AC Power in DC Link**, Changqing Qiu et al. present a regenerative cascade inverter topology with direct active power control scheme. The proposed control scheme is analyzed theoretically by simulation, and verified experimentally. Subramanian Vijayalakshmi and Thangasamy Sree Renga Raja present in their paper entitled **Time domain based Digital PWM controller for DC-DC converter** a discrete pulse width modulated controller for a buck converter, where also an analog controller is designed whose parameters are compared with the discrete PID controller. The paper entitled **Modeling of DC-link Connected Multiple-converter System Operating as Microgrid** by Miran Rodič presents design and evaluation of a dynamic model of multiple-converter system consisting of six power converters connected by DC-link. The model was created in Matlab/Simulink based on the existing system, with the goal of evaluating various power management strategies. In the eight paper, **Vector Control of Double Excited Synchronous Machine as Integrated Starter–Alternator**, Mohamed Bounadja et al. propose a double excited synchronous machine as integrated starter–alternator for future automobiles applications; particularly, the biaxial excitation synchronous machine is proposed. The ninth paper entitled **Friction with Hysteresis Loop Modeled by Tensor Product** by Károly Széll et al. introduces a pneumatic servo-system for investigation of the behavior of friction near the target position, where a new model is proposed which takes the hysteresis loop of the friction into consideration. The following paper entitled **Single Open-phase Fault Detection with Fault-Tolerant Control of an Inverter-fed Permanent Magnet Synchronous Machine** by Andraž Kontarček et al. presents a current predictive method for single open-phase fault detection in a three phase drive with a permanent magnet synchronous machine. The proposed

methods have been simulated in Matlab/Simulink and verified on an experimental model. Mario Bogdanović presents in his paper entitled **Frequency domain based LS channel estimation in OFDM based Power line communications** a low voltage power line communication realization with an emphasis on channel estimation techniques. Performance is compared with existing pilot based estimation algorithms in terms of their computational complexity, error correction, and suitability conditions. The paper entitled **Resource Allocation Algorithm with Dynamic Subcarrier Assignment in OFDMA-based Wireless Networks** by Vitomir Šeba et al. proposes a resource allocation method that is primarily based on assigning almost an equal bandwidth to all users, where system capacity maximization is achieved by selecting the subcarriers with the best SNR values. The results of the proposed algorithm are compared with the water filling and proportional fairness methods. In the following paper, **Self Organizing Networks: A Reinforcement Learning approach for self-optimization of LTE Mobility parameters**, Moazzam Islam Tiwana proposes a reinforcement learning based framework to improve throughput of the mobile users, where the problem of spectral efficiency maximization is modeled as co-operative multi-agent control problem between the neighbouring eNodeBs. Simulations test the network capacity and user experiences in terms of throughput. The last paper entitled **Mark without much Sweep Algorithm for Garbage Collection** by Danko Basch et al. proposes two improvements over a traditional mark-sweep collector, where the core idea is to place small objects of the same type in buckets which are organized in such way to eliminate the internal fragmentation, sweeping, and freeing inside them.

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