EDITORIAL

Dear reader,

You have at your desk the issue no. 3/2016 of the journal AUTOMATIKA, which contains 25 original scientific papers in the fields of signal processing, computer science, power electronics and systems, electric drives, control systems, robotics, communications and electronics.

In the first paper, ***Dynamic Management of Electrical Power Distribution Networks****, the authors Branimir Novoselnik et al. consider the problem of optimal dynamic management of electrical power distribution networks with distributed generation and storage. A simulation case study of a Croatian power distribution grid was used for testing purposes and to demonstrate the applicability and usefulness of the proposed control strategy. In the following paper,* ***PLL-based Rotor Flux Estimation Method for Sensorless Vector Controlled Squirrel-Cage Induction Generators****, Martina Kutija et al. presents a new rotor flux estimation method for sensorless vector controlled squirrel-cage induction generators used in wind power applications. Experimental results on a 560 kW squirrel-cage induction generator are presented to confirm the effectiveness and the feasibility of the proposed method. The following paper,* ***FCS-MPC Control Strategy for a New Fault Tolerant Three-level Inverter*** *by Mao Lin et al. presents a new topology for high reliability of aviation inverters with additional leg for independent neutral-point voltage control, driven by finite control set model predictive control and verified by the experiment. The fourth paper entitled* ***New Gen Algorithm for Detecting Sag and Swell Voltages in Single Phase Inverter System for Micro grid*** *by Teekaraman Yuvaraja et al. deals with a novel sag and peak detector. The suggested algorithm is proficient to sense the sag voltage through all regions. The proposed detector scheme is verified in simulations and experiments. The fifth paper entitled* ***Power Quality in Railway Traction and Compensation by Combining Shunt Hybrid Filter and TCR*** *by Navaneethakrishnan Gunavardhini and Muthial Chandrasekaran analyses the quality of electricity in railway traction. Based on collected traction load data from the traction sub-station, authors propose the approach to improve the power quality in traction systems. The following paper,* ***Robust Fuzzy Gains Scheduling of RST Controller for a WECS based on DFIG*** *by M'Hamed Doumi et al. presents control of wind turbine active and reactive power output based on fuzzy-RST and polynomial RST controllers. R. Pon Vengatesh and S. Edward Rajan in their paper entitled* ***Investigation of High gain MIC power converter for multicrystal PV module employing fuzzy logic technique*** *present a Mutual Inductive Coupled (MIC) DC-DC power converter circuit for Photo-Voltaic (PV) system employing fuzzy logic based maximum power point tracking. The proposed DC-DC converter has been modelled and simulated using Matlab-simulink environment for obtaining high gain. The obtained results reveal that, the fuzzy controller provides good improvement in tracking of maximum power and helps to extract considerable amount of additional solar energy from a PV module as compared with P&O algorithm. The following paper entitled* ***A Fault Tolerant Control Structure for an Induction Motor Drive System*** *by Kamil Klimkowski and Mateusz Dybkowski presents the Fault Tolerant (FT) vector controlled induction motor drive system. The influence of the rotor speed sensor faults is analyzed and fault detection algorithms are developed and described. The proposed system was tested in simulation and experiment. In their paper,* ***An Improved DTC for In-wheel BLDC motors in Micro All-electric Vehicles*** *Huan Liu and Hui Zhang propose an improved direct torque control, where the switching device operating principle is equivalent to that of a unipolar pulse width modulation technique. Analysis showed that under the improved*

algorithm the DC supply took up only the load current, confirming that there was no return of load energy to the dc supply, which protects the batteries. The paper entitled ***Half step position sensorless control of a Linear Switched Reluctance Motor based on back EMF****, by Kamel Ben Saad and Ahlem Mbarek, presents a position sensorless closed loop control of a switched reluctance linear motor where the aim of the proposed control is to damp the position of the studied motor. The efficiency of the proposed control solution was proven by simulations and experimental tests. The following paper entitled* ***Hybrid Self Tuned Fuzzy PID controller for speed control of Brushless DC Motor*** *by A. Ramya et al. investigate the performance of hybrid self tuned fuzzy proportional integral derivative controller for brushless DC motor drive. The authors show a detailed simulation study and performance comparison with other control approaches is performed to highlight the merits of the proposed work. The following paper,* ***Mathematical Modeling and Fuzzy Control of a Leveling and Erecting Mechanism*** *by Jiangtao Feng et al. presents a complete approach of workflow design, trajectory planning, leveling strategy and control method for six hydraulic cylinders Leveling and erecting mechanism, supported by experiments. Irfan Ahmad and Akram M. Abdurraqeeb in their paper,* H_∞ ***control design with feed-forward compensator for hysteresis compensation in piezoelectric actuators****, characterize the nonlinear hysteresis effect using the Prandtl-Ishlinskii model whose inverse is then employed as a feed-forward controller to compensate for hysteresis nonlinearities of the piezoelectric actuator. The experimental results verify the effectiveness of the proposed control scheme in achieving the improved tracking performance with peak-to-peak tracking error of less than 1% for the desired displacement of 12* μ*m with tracking frequency of 10 Hz. The fourteenth paper entitled* ***Descriptor Observer Based Fault Tolerant Tracking Control for Induction Motor Drive*** *by Habib ben Zina et al. presents an active fault tolerant control strategy for induction motor that ensures field oriented control and mitigates the effect of the sensor faults despite of the load torque disturbance. Authors used the fuzzy descriptor for the induction motor to simultaneously estimate the system state and the sensor fault. Based on the solution of the linear matrix inequality problem they determined the gains for the observer and controller, whereas the proposed strategy is validated in simulation and experiments. Erdal Kilic et al. in their paper entitled* ***Efficient speed control of induction motor using RBF based model reference adaptive control method*** *present a model reference adaptive speed controller based on artificial neural network for induction motor drives. They have developed an intelligent controller for induction motor speed control with combination of radial basis function type neural network and model reference adaptive control strategy. In order to demonstrate the reliability of the control technique, the proposed adaptive controller has been tested under different operating conditions and compared performance of conventional PI controller. The results show that the proposed controller has got a clear superiority to the conventional linear controllers. The paper entitled* ***On The Design of The Robust Neuro-Adaptive Controller for Cable-driven Parallel Robots*** *by Mojtaba Hadi Barhaghtalab et al. propose a robust neuro-adaptive controller for cable-driven parallel robots. Simulation results demonstrate that the proposed robust adaptive control system can achieve favorable tracking performance. T. Roubache et al. in their paper entitled* ***Backstepping design for fault detection and FTC of an induction motor drives-based EVs*** *present an improved sensorless fault-tolerant control for high-performance induction motor drives that propels an electric-vehicle. The design strategy is based on the Backstepping control and an appropriate combination with an extended Kalman filter designed in order to detect and reconstruct the faults and provide a support for a sensorless control. The effectiveness of the proposed strategy for detection of faults, and fault-tolerant control of the induction motor drive is illustrated through simulation studies. The following paper,* ***Observer-based Integral Sliding Mode Approach for Bilateral Teleoperation with Unknown Time Delay****, by Nicolás González et*

al. deals with force-reflecting control design for teleoperation of bilateral robots under unknown constant time delay. The proposed approach, owing to the finite-time convergence properties of the observer, guarantees robust tracking under unknown constant time delay. Emna Baklouti et al. in their paper entitled ***Autonomous wheelchair navigation with real time obstacle detection using 3D sensor*** *propose a robust, simple and real-time autonomous navigation module that drives a wheelchair toward a desired target, along with its capability to avoid obstacles in a 3D dynamic environment. Simulations and real world experiments results are reported to show the feasibility and the performance of the proposed control system. The following paper entitled* ***Calculating Limits of Base Station Emission Power in GSM*** *by Rade Švraka et. al. compares the influence of various factors on the output power of each GSM channel and connection. It also comapares the influence on the output power of whole base transceiver station in GSM network. It is analyzed how emission power of base station can be reduced by implementing various methods in signal sending. Branko Dokic and Aleksandar Pajkanovic in their paper entitled* ***Conventional and sub-threshold operation regimes of CMOS digital circuits*** *present a comparison of static and dynamic parameters of CMOS logic circuits operated in standard and sub-threshold regimes. They derive the analytic models of logic threshold voltage, logic delay and power consumption for the sub-threshold operation regime and show the analogies between these two regimes. Analytic models are verified by PSPICE simulation using the BSIM3 transistor models of the 0.18 μm CMOS technology process. The paper entitled* ***Spectral-Efficient Green Wireless Communications via Cognitive UWB Signal Model*** *by Farzad H. Panahi et al. focuses on spectral lines suppression for non-coherent impulse-radio ultra-wideband signals in the presence of pulse attenuation and timing jitter. Particular attention is devoted to severely unbalanced (i.e. non-uniform distributed) data sources where a unified spectral analysis is considered for both uncorrelated and correlated M-ary biorthogonal data-stream scenarios. The following paper,* ***Multiple Kinect V2 Calibration****, by Diana-Margarita Córdova-Esparza et al. proposes a method to easily calibrate multiple Kinect V2 sensors which requires the cameras to simultaneously observe a 1D object shown at different orientations (three at least) or a 2D object for at least one acquisition. To validate the calibration results we performed point cloud fusion using the depth and color information from four Kinect sensors. Abdullah M. Iliyasu et al. in their paper entitled* ***Evidence Accumulation Clustering with Possibilitic Fuzzy C-Means base clustering approach to disease diagnosis*** *present the technique that blends the Possibilistic Fuzzy C-Means (PFCM) as the base cluster generating algorithm into the 'standard' Evidence Accumulation Clustering (EAC) clustering. To validate the new technique's effectiveness, its performance on both synthetic and real medical datasets was evaluated alongside individual runs of well-known clustering methods, other unsupervised ensemble clustering techniques and some supervised learning methods. The results show that the proposed pEAC technique outperformed the individual runs of the clustering methods and other unsupervised ensemble techniques in terms accuracy for the diagnosis of different deseases. The last paper entitled,* ***Property Oriented Relational-To-Graph Database Conversion****, by Ognjen Orel et al. proposes a universal relational-to-graph data conversion algorithm which can be used in preparation of data to perform a graph mining analysis. The proposed approach leverages the property graph model which is mainly used by the graph databases, while maintaining the level of relational data clarity.*

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