

# EDITORIAL

**Dear reader,**

You have at your desk the issue no. 3/2015 of the journal AUTOMATIKA, which contains 12 original scientific papers in the fields of communications, estimation theory, robotics, power electronics and signal processing.

In the first paper, **Impact of Social Network to Churn in Mobile Network**, Niko Gamulin et al. analyze a model for predicting users that are most likely to churn, solely by observing each user's social network, which is formed by outgoing calls, and churn among their neighbours. The authors compare three models: spatial classification, regression model, and artificial neural networks. In the end they compare proposed method to complex models with large amounts of individual and/or social network input parameters. The following paper entitled **A Comparative Study of Ground Fault Analysis for a Practical Case of a Transmission Line Equipped with Different Series FACTS Devices** by Mohamed Zellagui et al. argues the necessity for using Flexible AC Transmission System (FACTS) devices due to extensively growing power networks. The paper investigates the impact of using series FACTS devices, namely Thyristor Controlled Series Capacitor, GTO Controlled Series Capacitor and Thyristor Controlled Series Reactor, on the impedance and power flow of a practical 400 kV transmission line in the Algerian power network. Simulations results obtained using MATLAB are demonstrated for the compensated and non-compensated line, and the simulations are compared to show the effect of using these devices for the studied cases. In the third paper, **Robust bearings-only tracking algorithm using structured total least squares-based Kalman filter**, Hao Wu et al. propose a nonlinear approach for solving tracking inaccuracy caused by outliers in bearings-only multi-station passive tracking. The algorithm is compared to conventional algorithms in simulations with respect to tracking performance in the presence of outliers. The paper entitled **Remote Monitoring and Control of Industrial Robot based on Android Device and Wi-Fi Communication** by Maja Lutovac Banduka presents a system for remote monitoring and control of industrial robots based on Android device and Wi-Fi communication which provides robot control at a great distance with simultaneously monitoring of robot motions by observing its 3D model movement or trajectory path. The author argues that the proposed solution simplifies an interaction between the human and the industrial robot in the case of robot motion control and tracking at remote location. In the following paper, **Efficient Energy Management System for Solar Energy**, J. Kamala and K. Santhosh propose a control architecture using field programmable gate array, that supports modular level implementation with defined interfaces for each sub-system. The system can be used with low power as well as high power photo-voltaic systems, and the efficiency is tested on a photo-voltaic system installed in educational institution. Subramanian Vijayalakshmi and Thangasamy Sree Renga Raja present in their paper entitled **Development of Robust Discrete controller for Double Frequency Buck converter** a discrete controller for high efficiency double frequency buck converter, where the buck converter is comprised of two buck cells: one works at high frequency, and another works at low frequency. Simulations are performed with MATLAB/Simulink, while experimental results are given to using LabVIEW with a data acquisition card. The paper entitled **Load Frequency Control for Micro Hydro Power Plants by Sliding Mode and Model Order Reduction** by Dianwei Qian et al. addresses the scheme of sliding mode control by model order reduction for the load frequency control problem of micro hydro power plants. Since such plants usually has two operating modes,

mathematical model and model reduction are investigated first for each of the modes, after which, according to the reduced-order model, a sliding mode control law is subsequently derived. In the end the presented scheme is then tested in simulations. In the eight paper, **Improved Method for Position Estimation Using a Two-Dimensional Scheduling Array**, Konrad Urbanski and Krzysztof Zawirski present results of studies on the position estimation for the permanent magnet synchronous motor drive using gain scheduling technique for tuning the observer's parameters. The authors argue that the novelty is in the use of a two-dimensional gain scheduling technique and the use in the sensorless drive, where traditional solution is simple one-input scheduling variable – mainly on drives with position sensors. The ninth paper entitled **Modelling and detection of failure in medical electrodes** by Ivan Marasović et al. studies failures in medical electrodes such as electroencephalogram electrodes being used for collecting brain signals. Since the electrode tip (needle) is covered with thin oxide film which acts as a dielectric and determines the total electrode resistance, the fluctuations of that resistance can give insights into defects of the whole structure. The simulation results show non-gaussian Bramwell-Holdsworth-Pinton distribution of the total resistance fluctuations which is then verified in experiments. In the following paper, **SFBC with clipping and filtering as a transmit diversity technique in SC-FDMA**, Darko Sinanović et al. present space-frequency block coding as a transmit diversity technique in single carrier frequency division multiple access, also known as a low peak-to-average power ratio modulation technique. Since the presented method increases peak-to-average power ratio additional clipping and filtering is proposed. The approaches are in the end compared in simulation scenarios. The paper entitled **Computational Aspects of Efficient Estimation of Harmonically Related Sine-Waves** by Ivo Beroš et al. proposes an actual implementation of a well-known method for spectral analysis of signals composed of harmonically related sine waves. By utilizing matrix factorizations and mathematical "shortcuts", several algorithms have been developed, which perform computations efficiently and make the method suitable for large-scale applications. The last paper entitled **A Review of Contactless Electrical Power Transfer: Applications, Challenges and Future Trends** by Saeed Hasanzadeh and Sadegh Vaez-Zadeh present surveys on methods of contactless electrical power transfer technologies. The principles, structures and operations of the systems as well as their methods presented in the literature are reviewed and their applications are explored. Finally, some remarks and recommendations regarding future studies are proposed.

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