Editorial Note

Hereby, the first issue of Iranian Journal of Electrical and Computer Engineering in its sixth year of publication is presented to its readers. Eleven papers are offered in this issue, which begins with a Special Section Power Engineering that contains five articles. The section starts with a paper by Subramanian and Bhuvaneswar, which discusses the application of particle swarm optimization method to optimal design of self-excited cage induction generator. In this paper they formulate the optimization problem as a nonlinear multivariable programming problem with several independent variables and constraints. Moreover, five different objective functions are considered for optimization in order to select a desired design.

In the next article, Parniani *et al.* study the performance of power system stabilizer of a large thermal power plant, as tuned by the manufacturer. Moreover, they redesign and analyze the stabilizer based on extended phase compensation of the exciter input–electrical torque transfer function and root locus analysis; and its effect on local, interplant, and inter-area electromechanical oscillations. Then they study the effect of PSS with existing and new tunings on transient stability and perform simulations and experimental tests.

The third paper presented by Joshi *et al.* proposes a new control algorithm for a matrix converter induction motor drive system. They use a back-propagation neural network to adjust a pseudo dc bus voltage to reduce the current harmonics of the induction motor. Then, a two-degree-of-freedom controller is proposed to improve the system performance. The design algorithm can be applied in both an adjustable speed control system and a position control system.

The fourth paper authored by Ramesh and Ramachandran develops a distributed model using grid environment to solve the economic load dispatch of multi-area power systems. Grid computing is a viable solution in order to exploit the enormous amount of computing power available across Internet to solve large interconnected power system problems.

Finally, the Special Section is concluded by an article presented by Hatami and Parsa Moghaddam which suggests a three-phase load flow for unbalanced distribution systems. The proposed method uses equivalent current injections, based on Newton-Raphson method. The load flow issue is considered as an optimization problem and is decoupled into two subproblems. The proposed method has been tested on the IEEE 13 Bus.

This issue of journal also includes six regular papers. The first paper is in the field of computer engineering. It is presented by Ayatollahzadeh Shirazi and Abdollahzadeh Barfouroush and discusses the agent-oriented software engineering as a layered technology and describe the layers of this technology are quality, agent-oriented software development process, agent-oriented methods, agent-based system architecture and agent development tools. Yaacoub *et al.* study the hybrid linear and circular antenna arrays in the next article. This paper defines three types of such hybrid antenna arrays, i.e., concentric circular, cylindrical, and coaxial cylindrical antenna arrays. It explains the expressions of their array factors, simulates their directivities and half power beam widths. In the third paper, Al-Khatib and K.Gunavathi reports an algorithm for bandwidth allocation in DOCSIS based hybrid fiber coaxial networks. This algorithm has been proposed to support VBR multimedia traffic over DOCSIS. The proposed scheduling algorithm makes use of piggybacking request and changes the unsolicited grant size allocation dynamically. In the next paper presented by Srinivasan *et al*. the fault diagnosis problem of deaerator in the thermal power plant unit is addressed and the application of neural networks for this purpose is discussed. They investigate the use of three neural networks structures, i.e., self-organizing map, back propagation, and radial basis function neural networks for detecting eight types of faults in such systems. In the fifth paper authored by Ramireddy the harmonic balance finite element method is used to estimate the components of magnetic field inside a specimen of ferromagnetic core to calculate the iron losses. The problem is discussed for the cases that either a single excitation or a double excitation is applied to a specimen.

The issue concludes by a paper submitted by Hsu which addresses the nonlinear pull-in behavior for different electrostatic micro-actuators. It explains the use of differential quadrature method and Wilson-θ method to overcome the difficulty of solving nonlinear equation. It shows that the differential quadrature method is an efficient method to solve the nonlinear deflection of uniform actuator and non-uniform actuator. It also investigates the effects of applied voltage, squeeze film force, external loading and residual axial loading on the behavior of the electrostatic actuator.

Pleasant Reading,

H. R. Sadegh Mohammadi
Editor-in-Chief