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Special Session on "Bio-inspired Computation and Its Applications in Power System" (BiCAPS)

Session Chair:
Name: Dr. R Lal Raja Singh
Organization: KIT-KalaignarKarunanidhi Institute of Technology, INDIA

Email: lalrajasingh@gmail.com
Mobile: 9443371311

Theme of Session:

Bio-inspired computation is an umbrella term for different computational technologies that are based on principles or models of biological systems. This class of approaches, including evolutionary algorithm, swarm intelligence, and artificial immune system, complements traditional ones in the sense that the former can be applied to large and complex combination optimization problems, but the latter encounters difficulties. Therefore, bio-inspired technologies are becoming important in the face of solving discrete and dynamic problems.

Recently, the bio-inspired computation has attracted much attention of researchers and has also been widely applied to Electric Power Systems in Generation, Planning Scheduling and integrating Renewable Energy technologies into normal conventional power systems. However, due to complexity and uncertainty in the problems, it is very difficult to find out the optimum solution under the limited resources, time, and money in real-world applications using the bio-inspired technologies. Therefore, it is necessary to develop efficient or improved algorithms to solve Electric Power Systems problems.

The main objective of this special session is to present the original research and review articles on the latest theoretical and practical achievements that will contribute to the field of bio-inspired computation and its applications in Electric Power Systems.

Topics of Interest:
Full length original and unpublished research papers based on theoretical or experimental contributions related to the below mentioned tracks are invited for submission in this special session:

Tracks: Research papers and workshop proposals are invited on, but are not limited to, the following topics:

Industrial Power Systems

Plant Performance and Optimization

Power Generation Systems

Modelling and Simulation

Load Modelling

Forecasting and Management

Power Quality and Grounding

Maintenance and Operation

Distribution System Planning and Reliability

Flexible AC Transmission Systems

Power System Control and Stability

Renewable Power Generation

Renewable Energy for IT Equipments

Renewable Fuel from Biomass

Distributed and Co-Generation Systems

Wind Energy Systems

Solar Energy Systems,

Hydro Power Plants

Hydrogen Systems and Fuel Cell

Energy Management and Environmental issues

Hybrid Power Systems

Power Market and Power System Economics

Smart Grid

Smart grid for distributed energy resources

Smart grid in interdependent energy infrastructures

Smart grid for intelligent monitoring and outage management

Smart grid applications and technologies

Smart grid for plug-in vehicles and low-carbon transportation alternatives

Smart grid for cyber and physical security systems

Power Electronics, Systems and Applications

Soft switching converters

Hard-switching and soft-switching static converters

Multilevel converters

Matrix converters

Emerging topologies

Power Converters Modelling

Simulation and Control

Power Factor Correctors (PFC)

EMI and over-voltage protection

Active Filters and Harmonics

Power Supplies

Power Electronics Components and Packaging

Inverter and Converter Technology

Electric Drivers and Application

Electronic Materials

Education and Training for Electrical Engineers

Nanometer-scale materials engineering

Optoelectronic photonic devices

Power semiconductors, passive components and packaging technologies

Switch-mode power supplies and UPS

Applications of power electronics

FACTS Power quality issues, harmonic problems and solutions

Power electronics in traction and automotive

Applications of power electronics in home appliance, industry and aerospace

Modeling and simulation in power electronics

Power electronics education/professional development

Telecommunications power supplies

Electronics, Information & Control Systems

Paper Submission Process:
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For any further queries related to this special session, please contact the session chairs at:

Name: Dr. R Lal Raja Singh

E-mail ID: lalrajasingh@gmail.com

Mobile No.: +91-9443371311

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