

FUZZ-IEEE 2016 Call for Papers

Special Session on Fuzzy Systems on Renewable Energy

● Abstract

Renewable power generation systems in general include wind, photovoltaic (PV), fuel cell and biomass power generation systems. They have been getting more attention recently due to cost competitiveness and environment friendly, as compared to fossil fuel and nuclear power generations. Owing to the relatively higher investment cost of renewable power generation systems, it is important to operate the systems near their maximum power output point, especially for the wind and solar PV generation systems. Thus, maximum power point tracking (MPPT) techniques are often required. Moreover, since the wind and solar PV power resources are intermittent, accurate predictions and modeling of wind speed and solar insolation are necessary, though difficult. Plus, to have a more reliable power supply, renewable power generation systems are usually interconnected with the electrical network. As a result, modeling and controlling the electrical network using smart-grid techniques, such as smart meter, micro-grid, and distribution automations become very important issues. On the other hand, due to the highly nonlinear and time-varying nature with unmodeling dynamics, effective uses of computational intelligence techniques such as fuzzy systems for the controlling and modeling of renewable power generation in a smart-grid system turn out to be very crucial for successful operations of the systems. Hence, topics of interest of the special session on Fuzzy Systems of Renewable Energy would cover the whole range of researches and applications of fuzzy systems in renewable power generations and smart grid systems.

● Keywords

Renewable power generation, maximum power point tracking, smart grid, fuzzy modeling, fuzzy control, computational intelligence.

● Topics of interest (not limited to)

- ◆ Fuzzy modeling of renewable power generation systems
- ◆ Fuzzy control of renewable power generation systems
- ◆ Prediction of renewable energy using fuzzy systems
- ◆ Hybrid systems of computational intelligence techniques in renewable power generation systems
- ◆ Fuzzy energy management systems
- ◆ Fuzzy distribution systems automation
- ◆ Fuzzy power quality, protection and reliability analysis of power system

● Session organizers:

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● Tentative list of presentation

Faa-Jeng Lin (Taiwan)	Francesco Grimaccia (Italy)
Tomonobu Senjyu (Japan)	Hong-Tzer Yang (Taiwan)
Hak-Keung Lam (UK)	Rong-Jong Wai (Taiwan)

● **Brief Bios**

Faa-Jeng Lin (M'93, SM'99) is currently Chair Professor with the Department of Electrical Engineering, National Central University, Chung-Li, Taiwan. He is also the Chair, Intelligent grid focus center, National Energy Project, Ministry of Science and Technology, Taiwan. His research interests include intelligent (fuzzy systems, neural networks and evolutionary computation) control theories, nonlinear (adaptive and sliding-mode) control theories, control theory applications, AC motor servo drives, ultrasonic motor drives, renewable energy systems, power electronics, and microgrid. He has published more than 188 SCI journal papers including more than 84 IEEE Trans. papers in the areas of intelligent control, nonlinear control, motor drives, renewable energy systems and mechatronics. Several of these referred papers helped to establish research areas such as fuzzy neural network control of motor drives and intelligent motion control systems. He was the Chair, Power Engineering Division, National Science Council, Taiwan, 2007 to 2009. Moreover, he served closely to IEEE activities such as Fuzzy Systems Technical Committee of CIS, Chair of IE/PEL Taipei Chapter, Director and Officer of Taipei Section, and Chair of CIS Taipei Chapter. Furthermore, Prof. Lin is the Chair and principle investigator of the National Energy Project - Smart Grid Focus Center in Taiwan. This project aims to integrate Taiwan's R&D resources in smart grid and renewable energy resources in an effective manner, to formulate overall development strategies and implementation approaches, to achieve the vision of enhancing energy security, to reduce greenhouse gas emissions and to support the development of power industries in Taiwan. The research budget is more than 30 million US dollars for the past three years, and thirty major power facilities companies such as TATUNG and DELTA have invested tens of millions in this project. Most importantly, intelligent systems have been developed for the converter control of renewable energy resources, modeling, the optimization of smart grids, and forecasting for wind and PV.

Hong-Tzer Yang (M'02, SM'08) was born in Tainan, Taiwan, R.O.C., on March 19, 1960. He received the B.S. and M.S. degrees in electrical engineering from National Cheng-Kung University, Tainan, Taiwan, in 1982 and 1984, respectively, and received the Ph.D. degree in electrical engineering from National Tsing-Hua University, Hsin-Chu, Taiwan, in 1989. From 1989 to 1992, he was a Senior Specialist and was a Technical Superintendent from 1993 to 1995, with the Chung Shan Institute of Science and Technology, Kaohsiung, Taiwan, where he developed an artificial intelligence-based target identification system and a real-time hardware-in-the-loop simulation system. From 1995 to 2000, he was an associate professor with the Department of Electrical Engineering, CYCU. In 2000, he was promoted to a full professor. He chaired IEEE PES Taipei

Chapter in 2002 and was the Director of Incubation Center, CYCU in 2000-2003 and the Chair of Department of Electrical Engineering, CYCU in 2002-2004. In 2007, he joined the faculty of Department of Electrical Engineering, NCKU as a professor and Director of Electrical Laboratories.