

## General Information

Birth: January 25th, 1973. Lanzhou, China  
Nationality: Chinese  
Current Status: Research Scholar  
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## Research Interests

**Hybrid intelligent forecasting system:** Short-term electricity demand forecasting; Electricity price forecasting in day-ahead market and real-time market; Wind energy generation forecasting.

**Power system control and high-power power electronics:** Excitation control for synchronous generator, power system coordinated control for stability improvement. Medium voltage variable frequency drive system and electronic power transformer.

## Summary

Shu Fan received the B.S. degree in electrical machine and apparatus from Huazhong University of Science & Technology (HUST), Wuhan, China, in 1995. After graduated, he had been employed by Changzhou Transformer Company as a design engineer for two years. Then he obtained his M.S. and Ph.D. degrees in electrical engineering, from HUST, in 2000 and 2004, respectively. Currently he is a Japanese Government research scholar in Osaka Sangyo University. During the period in HUST, his areas of interest lie in power system modeling, generator control, stability analysis, development of medium voltage variable frequency drive system, and Electronic Power Transformer (EPT). Presently, he mainly focuses on the hybrid forecasting system in power system based on neural network and machine learning technique. In the past years, he has published papers in the principal journals in the area of Electrical engineering, including IEEE Transactions and IEE Proceedings. He coauthors a book and obtains two patents. In 2004, he has been awarded the Japanese Government Scholarship. And he has been awarded 2<sup>nd</sup> Place Award of Edison Cup of Technology Innovation Competition by GE Foundation based on proposal with a novel topology of EPT and its control strategy. He was selected as top ten excellent graduate students of HUST, and occupying the No. 1 position in the competition. His doctor dissertation has been awarded the excellent doctor dissertation in HUST and is now competing for national excellent doctor dissertation of China.

## Education

Degree	Field	Name of University
Doctor 2000-2004	Electrical engineering	Huazhong University of Science & Technology
Master 1997-2000	Electrical engineering	Huazhong University of Science & Technology
Bachelor 1991-1995	Electrical Machinery and Apparatus	Huazhong University of Science & Technology

## Professional Experience

Visiting scholar To begin from Aug. 2006	Energy Systems Research Centre, University of Texas at Arlington
Visiting scholar 2006.6-2006.7	Department of Electrical Engineering, Tokyo Metropolitan University
Research scholar 2004.10-2006.7	Department of Electronics, Information, and Communication Engineering, Osaka Sangyo University, sponsored by Japanese Government
Engineer 1995-1997	Changzhou Transformer Company, China

## Awards and Fellowships

- “Japanese Government Scholarship” awarded by Japanese Government (Monbukagakusho: MEST) 2004
- “2<sup>nd</sup> Place Award of Edison Cup of Technology Innovation Competition” awarded by GE Foundation 2004
- “Ten excellent graduate students of Huazhong University of Science & Technology” awarded by Huazhong University of Science & Technology 2004
- “Excellent doctor dissertation” awarded by Huazhong University of Science & Technology 2005

## Selected Publications

### A) books

1. J. Lu, C. Mao, S. Fan, D. Wang, Excitation Control of Synchronous Generator. China Electric Power Press, 2006, In Chinese

### B) articles in refereed journals

#### Under review:

1. S. Fan, J. Liao, R. Yokoyama, and L. Chen, “Forecasting the Wind Generation Using A Two-stage Hybrid Network Based on Meteorological Information,” submitted to *IEEE Trans. Energy Conversions* (TEC-00248-2006)
2. S. Fan, J. Liao, and L. Chen, “Application of An Integrated Machine Learning Model to Short-term Electricity Price Forecast,” submitted to *IEEE Trans. Knowledge and Data Engineering* (TKDE-0188-0406)

#### In Press:

3. S. Fan, C. Mao, L. Chen, “Electricity Peak Load Forecasting with Self-Organizing Map and Support Vector Regression,” to appear: *T. IEE Japan*, 2006
4. S. Fan, C. Mao, L. Chen, “Next-Day Electricity Price Forecasting Using a Hybrid Network,” to appear: *IEE Proc. Generation, Transmission & Distribution* (GTD-2006-0006)

#### Published:

5. S. Fan, C. Mao, L. Chen, “Optimal coordinated PET and generator excitation control for power systems,” *International Journal of Electrical Power & Energy Systems*, Vol. 28, No. 3, pp. 158-165, 2006
6. S. Fan, L. Chen, “Short-Term Load Forecasting Based on an Adaptive Hybrid Method,” *IEEE Trans. Power Systems*, Vol.21, No.1, pp.392-401, 2006
7. D. Wang, C. Mao, J. Lu, S. Fan, “Simulation research on imbalance loads of electronic power transformer in distribution system,” *Electric Power*, Vol.38, No.11, pp. 21-26, 2005, In Chinese
8. D. Wang, C. Mao, J. Lu, S. Fan, “Electronic Power Transformer-Based Power Quality Control Method,” *High Voltage Engineering*, Vol.31, No.8, pp.63-65, 2005, In Chinese
9. D. Wang, C. Mao, S. Fan, H. Ma, “Design of Heat Sinking in High Voltage Variable Frequency Drive System,” *Power Electronics*, Vol.39, No.2, pp.115-117, 2005, In Chinese
10. S. Fan, C. Mao, J. Lu, C. Zhang, “Neural Network Based Optimal Excitation Controller for Multi-machine Power System,” *Proceedings of the CSEE* (Chinese Society for Electrical Engineering), Vol.24, No.7, pp.80-84, 2004, In Chinese

11. S. Fan, C. Mao, J. Lu, O. P. Malik, "Real-time Optimal Excitation Controller Using System Identification," *Australian Journal of Electrical & Electronics Engineering*, Vol.1, No.1, pp.7-13, 2004
12. Z. Hu, C. Mao, J. Lu, S. Fan, "Grey Excitation Controller for Synchronous Generator," *The Journal of Grey System*, Vol.16, No.1, pp51-58, 2004
13. S. Fan, C. Mao, J. Lu, "Real-time Excitation Controller Using Neural Networks," *Engineering Intelligent Systems*, Vol.11, No.3, pp.151-156, 2003
14. C. Mao, W. Li, J. Lu, S. Fan, "Study of the Common-mode Voltage in a High-voltage Adjustable Speed Drive System," *Proceedings of the CSEE (Chinese Society for Electrical Engineering)*, Vol.23, No.9, pp.57-62, 2003, In Chinese
15. C. Mao, S. Fan, Y. Huang, J. Lu, "Theory of Power Electronic Transformer and Its Applications (II), *High Voltage Engineering*," Vol.29, No.12, pp.1-3, 2003, In Chinese
16. C. Mao, S. Fan, D. Wang, H. Fang, Y. Huang, "Theory of Power Electronic Transformer and Its Applications (I), *High Voltage Engineering*," Vol.29, No.10, pp.4-6, 2003, In Chinese
17. Z. Hu, C. Mao, J. Lu, S. Fan, "Fuse Protection of IGCT in High Power Inverter," *High Voltage Engineering*," Vol.29, No.1, pp.8-10, 2003, In Chinese
18. Y. Li, D. Xiao, Y. Huang, C. Mao, S. Fan, "Model Establishment and Parameters Optimization for Optimal Excitation Controller of Gezhouba Hydropower Plant," *Power System Technology*, Vol.26, No.7, 2002, pp56-59, In Chinese

C) contributions to academic conferences

1. S. Fan, J. Liao, K. Kaneko, and L. Chen, "An Integrated Machine Learning Model for Day-Ahead Electricity Price Forecasting," to be presented in IEEE PES Power System Conference and Exposition 2006, 27 Oct-1 Nov 2006, Atlanta, Georgia USA.
2. S. Fan, C. Mao, J. Zhang, and L. Chen, "Forecasting Electricity Demand by Hybrid Machine Learning Model", to be presented in the 13th International Conference on Neural Information Processing, October 3-6, 2006, Hong Kong.
3. L. Chen, S. Fan, S. Fukutome, T. Wachi, Y. Makino, and G. Koshimizu, "Tracing Bidding Price in Electricity Market Based on Single Price Auction Model," IEEE/PES T&D Conference & Exhibition: Asia Pacific, Dalian, China, 2005
4. G. Li, C. Mao, J. Lu, Y. Wan, S. Fan, "Large Scale Synchronous Generator Control with High-Low Voltage Rectifier Bridges Excitation System," 2005 IEEE/PES IEEE/PES T&D Conference & Exhibition: Asia Pacific, Dalian, China, 2005
5. S. Fan, C. Mao, L. Chen, "Peak Load Forecasting Using the Self-Organizing Map," *Advances in Neural Networks-ISNN 2005*, Springer, Part III, pp.640-649, 2005
6. D. Wang, C. Mao, J. Lu, S. Fan, "A Novel Power Quality Controller for Distribution Systems," Proceedings of the International Conference on Electrical Machines and Systems, Jeju Island, Korea, 2004.
7. S. Fan, C. Mao, J. Lu, W. Li, L. Chen, "Optimal Coordinated Generator Excitation and SMES Control for Transient Stability Improvement of Power System," Proceedings of 38<sup>th</sup> International Universities Power Engineering Conference, Thessaloniki, Greece, 2003, pp.329-332
8. D. Wang, C. Mao, J. Lu, S. Fan, X. Duan, "Design of snubber for series IGCTs used in high power and medium voltage converter", Proceedings of 38<sup>th</sup> International Universities Power Engineering Conference, Thessaloniki, Greece, 2003, pp. 157-180
9. S. Fan, C. Mao, J. Lu, L. Chen, "Stability control strategy of power system based on PET," Proceedings of the 4<sup>th</sup> International Conference on Power Transmission & Distribution Technology, Changsha, China, 2003, pp.564-569
10. J. Lu, D. Wang, C. Mao, S. Fan, "Study of RC-Snubber for series IGCTs," Proceedings of International Conference on Power System Technology, PowerCon2002, Kunming, China, Vol.1, pp.595-599
11. Z. Hu, C. Mao, J. Lu, S. Fan, "Fuse protection of IGCT's against rupture in three-level commutated inverter," Proceedings of International Conference on Power System Technology, PowerCon2002, Kunming, China, Vol.1, pp.611-615

D) patents

1. C. Mao, S. Fan, H. Fang. Power Electronic Transformer. P.R. China, Invention Patent, Patent No.: ZL 02 1 39030.4
2. C. Mao, J. Lu, S. Fan, D. Wang. On-load Tap Changer Transformer with Smooth Voltage Regulation, Practical New Pattern Patent, Patent No.: ZL 2004 2 0017192.9

## Referees:

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