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# Professor Xiao-Ping Zhang PhD, IEEEE Senior Member

Professor of Electrical Power Systems
Director of Institute for Energy Research and Policy

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## About

Xiao-Ping Zhang is a Professor of Electrical Power Systems, Director of Institute for Energy Research and Policy, and Head of the **Power & Control research group (/research/activity/eece/systems-devices/communications/power-control.aspx)** .

Xiao-Ping has published over 100 research papers in scientific journals, conference proceedings as well as reviews, books and book chapters in the fields of Smart Grids, modelling and control of FACTS and HVDC, renewable generation (wind and wave) control, integration of PHEVs into power grids, energy markets & game theory applications, smart metering and wide area grid awareness.

He has received major grants from UK Government Science City Initiative, FP7 EU Smart Energy Network (Smart Grid) Programme, etc.

## Qualifications

- Senior Member of IEEE
- PhD in Electrical Engineering, 1993
- MSc in Electrical Engineering, 1990
- BEng (Hons) in Electrical Engineering, 1988

## Biography

Professor Xiao-Ping Zhang has some twenty years international engineering and academic R&D experience ranging from China and Germany, to the UK with a focus on Electrical Power Systems Engineering. In April 2007, Professor Xiao-Ping Zhang joined the University of Birmingham taking up the post of Reader in Energy Distribution Systems and Director of the University Institute for Energy Research and Policy after spending 7 years with the University of Warwick as lecturer, senior lecturer and then associate professor.

Professor Zhang previously had several years' industry experience for the development of commercial SCADA/EMS/DMS products for the monitoring, operation decision and control of electricity networks. He held a visiting position with the Electrical Energy and Power Systems Research Group at UMIST (now the University of Manchester), UK in 1998/99 and a position of Alexander von Humboldt Research Fellow with the Institute of Power Systems and Power Economics at Dortmund University, Germany in 1999/2000, which is a life-long honor.

Professor Zhang's research activities include smart grid technologies; FACTS (Flexible AC Transmission Systems) and HVDC applications in electric power systems operation & control; integration of renewable generation including wind and wave energy generation systems into power grids; hybrid vehicles, smart metering and electricity market modeling & analysis, etc sponsored by UK Research Councils, Industry, UK Government and European Commission FP7 Smart Energy Network (Smart Grid) Programme. He has established two advanced electrical power systems laboratories at the University of Birmingham, namely Smart Power Grid Laboratory and Real-time Power Grid Simulation, Measurement, Protection and Control laboratory.

Professor Zhang has over 100 publications including 3 books. Xiao-Ping has been an invited speaker for many panel & plenary sessions of International Conferences. He is Co-Chair of the IEEE Power & Energy Society Working Group on Test Systems for Economic Analysis. He is also the secretary of IFAC Technical Committee on Power Plants and Power Systems. He is an IEEE PES Distinguished Lecturer and Editor of the IEEE Transactions on Smart Grid and Power Systems.

## Teaching

- Energy Engineering Programme
- Electronic and Electrical Engineering Programme

## Postgraduate supervision

Xiao-Ping is interested in supervising doctoral research students in the following areas:

- Electrical Power Systems
- Smart Grids
- Power Electronic Control – FACTS and VSC HVDC
- Renewable Generation Control
- Integration of PHEVs into Power Grids

- Smart Metering, Wide Area Awareness and Self-healing Power Grid
- Energy Markets and Game Theory

If you are interesting in studying any of these subject areas please contact Xiao-Ping on the contact details above, or for any general doctoral research enquiries, please email: **dr@contacts.bham.ac.uk (mailto:dr@contacts.bham.ac.uk)** or call +44 (0)121 414 5005

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## Research

- Technologies for smart grids
- Application of power electronics such as FACTS (Flexible AC Transmission System) and HVDC in transmission and distribution systems
- Integration of PHEVs into power grids
- Protection and control of distribution networks with distributed generation
- Micro-generation and Micro-grid
- Smart metering and wide area monitoring and awareness
- Power system economics
- Large scale power system optimisation and planning
- Analysis and control of power system stability
- Power quality and harmonics

## Other activities

- Editor, IEEE Transactions on Smart Grid
- Editor, IEEE Transactions on Power Systems
- Editor, IEEE Power Engineering Letters
- IEEE PES Distinguished Lecturer
- Secretary of Technical Committee (TC) 6.3 Power Plants and Power Systems, IFAC - International Federation of Automatic Control
- Co-Chair of the IEEE Power & Energy Society Working Group on Test Systems for Economic Analysis

## Publications

X-P Zhang, Restructured Electric Power Systems: Analysis of Electricity Markets with Equilibrium Models, ISBN: 978-0-470-26064-7, IEEE Press/Wiley. 330 pages, June 2010.

X-P Zhang, C Rehtanz, B C Pal, Flexible AC Transmission Systems: Modelling and Control, ISBN 3-540-30606-4, Monograph, Springer Power Systems Series, 383 pages, Springer, March 2006.

F. Wu, X. P. Zhang, P. Ju, and M. J. H. Sterling, “Optimal Control for the AWS based Wave Energy Conversion System,” IEEE Transactions on Power Systems, vol. 24, no. 4, Nov. 2009, pp. 1747-1755.

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F. Wu, X. P. Zhang, P. Ju, M.J.H. Sterling, “Modeling and Control of AWS based Wave Energy Conversion System Integrated into Power Grid”, IEEE Transactions on Power Systems, vol. 23, no. 3, August 2008, pp. 1196 – 1204.

F. Wu, X.-P. Zhang, P. Ju, M.J.H. Sterling, “Decentralized Nonlinear Control of Wind Turbine with Doubly Fed Induction Generator,” IEEE Transactions on Power Systems, vol. 23, no. 2, May 2008, pp. 613 - 621.

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S. Petoussis, X.-P. Zhang, K. Godfrey, "Electricity Market Equilibrium Analysis based on Nonlinear Interior Point Algorithm with Complementary Constraints," IET - Generation, Transmission and Distribution, vol. 1, no. 4, July 2007, pp. 603-612.

X.-P. Zhang, “Robust Modeling of the Interline Power Flow Controller and the Generalized Unified Power Flow Controller with Small Impedances in Power Flow Analysis,” Electrical Engineering (Archiv für Electrotechnik), vol. 89, no. 1, 2007, pp. 1-9

X.-P. Zhang, C. Rehtanz, Y. Song, (Invited Article) "A Grid for Tomorrow," IET Power Engineer, Oct/Nov 2006, pp. 22-27.

C.-F. Xue, X.-P. Zhang, K.R. Godfrey, “Design of STATCOM Damping Control with Multiple Operating Points: A Multi-model LMI Approach”, IEE Proc. - Generation, Transmission and Distribution, vol. 153, no. 4, July 2006, pp. 375-382

X.-P. Zhang, P. Ju, E.J. Handschin, “Continuation Three-Phase Power Flow: A Tool for Voltage Stability Analysis of Unbalanced Three-Phase Power Systems,” IEEE Transactions on Power Systems, vol. 20, no. 3, Aug 2005, pp.1320 – 1329

X.-P. Zhang, “Multiterminal Voltage-Sourced Converter Based HVDC Models for Power Flow Analysis”, IEEE Transactions on Power Systems, vol. 18, no. 4, 2004, pp.1877-1884

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