Message from Editors

Due to high torque density and efficiency, permanent magnet machines have been used for many applications, ranging from domestic appliance, industrial automation, robot, electric vehicle, to wind power generation etc. Various novel permanent magnet machine topologies have been developed and many new topologies are still emerging, whilst many novel control strategies are being developed. On the other hand, magnetless machines, including induction, switched and synchronous reluctance, and wound-field synchronous machines, can eliminate the use of expensive rare-earth magnets and their design, analysis and control are currently under extensive investigation.

In this Special Section on “Novel Permanent Magnet and Magnetless Machines and Controls”, 19 invited and submitted papers are selected. It aims to provide a forum for professionals from both academia and industry to exchange their experience and achievements within the scope of machine topology, design, analysis, control and applications of permanent magnet and reluctance machines. The first part consists of 8 invited papers on the overview of recent development of novel permanent magnet and reluctance machines, including magnetically geared machines, high speed machines, variable flux memory machines, fault-tolerant machine, novel linear machines, dual flux modulation machines, novel reluctance machines, and modular machines etc. The second part has 6 papers on the control of electric drives, including one invited overview on sensorless control for AC motor drives, and others on direct torque and vector controls, as well as current control, predictive control, and fuzzy sliding mode control. The third part having 5 papers is on the design, analysis and optimization of permanent magnet and reluctance machines.

We would like to thank all the authors for their great contributions.

Professor Z. Q. Zhu
Deputy Editor-in-Chief

Guangjin Li, Wei Hua, Lijian Wu
Kai Wang, Xu Liu, Kan Liu
Guest Editors
Deputy Editor-in-Chief:

Professor Z. Q. Zhu received the B. Eng. and M. Sc. degrees in electrical and electronic engineering from Zhejiang University, Hangzhou, China, in 1982 and 1984, respectively, and the Ph. D. degree in electrical and electronic engineering from The University of Sheffield, Sheffield, U.K., in 1991. Since 1988, he has been with The University of Sheffield, where he is currently a Professor with the Department of Electronic and Electrical Engineering, Head of the Electrical Machines and Drives Research Group, Royal Academy of Engineering/Siemens Research Chair, Academic Director of Sheffield Siemens Wind Power Research Centre, Director of Midea Electrical Machines and Controls Research Centres, Director of Sheffield CRRC Electric Drives Technology Research Centre. His current major research interests include the design and control of permanent-magnet brushless machines and drives for applications ranging from automotive through domestic appliance to renewable energy, on which he has published >1000 papers, including >350 papers at IEEE Transactions and IET Proceedings. He is Fellow of the Royal Academy of Engineering, Fellow of IEEE, and Fellow of IET.

Guest Editors:

Dr. Guangjin Li, University of Sheffield, UK, g.li@sheffield.ac.uk
Prof. Wei Hua, Southeast University, China, huawei1978@seu.edu.cn
Prof. Lijian Wu, Zhejiang University, China, ljw@zju.edu.cn
Prof. Kai Wang, Nanjing University of Aeronautics and Astronautics, China, lsnwkw@hotmail.com
Prof. Xu Liu, Hebei University of Technology, China, liuxuee@gmail.com
Prof. Kan Liu, Hunan University, China, lkkan@live.cn