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## Editorial

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### Jianqiu Li\* and Liangfei Xu

State Key Lab of Automotive Safety and Energy,  
School of Vehicle and Mobility,  
Tsinghua University,  
Beijing 100084, China  
Email: lijianqiu@tsinghua.edu.cn  
Email: xuliangfei@tsinghua.edu.cn  
\*Corresponding author

**Biographical notes:** Jianqiu Li is the Dean of the School of Vehicle and Mobility (SVM) in Tsinghua University. He received his BE and PhD degrees from Tsinghua in 1995 and 2000, respectively. He visited RWTH Aachen in Germany in 2004, and serves as the Leader of New Energy Vehicle research Team from 2011. His research interests include design, diagnosis, control and optimisation of polymer electrolyte membrane (PEM) fuel cells, battery management systems, advanced internal combustion engines, hybrid and electric vehicles and automotive mechatronics systems. He received Second Prizes of National Technical Invention in 2007 and 2010 for advanced diesel engine control system and PEM fuel cell city buses, respectively, and the First Prize of China Automotive Industry Science and Technology Award in 2019.

Liangfei Xu is the deputy director of Vehicular Powertrain Engineering Institute at SVM in Tsinghua. He received his BE and PhD degrees from Tsinghua in 2003 and 2009, respectively. From 2015 to 2017, he was with Forschungszentrum Juelich in Germany as an Alexander von Humboldt Research Fellow. He services as the Associate Editor of *International Journal of Powertrains* and an Editorial board member of *eTransportation*. His research interests include modelling and control of fuel cells and new energy vehicles. He received China Industry-Academy-Research Cooperation Innovation Award and the First Prize of China Automotive Industry Science and Technology Award in 2019.

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This issue of ‘Advanced powertrain technologies for new energy vehicles: modelling, control and optimisation’ is organised to celebrate the election of Professor Minggao Ouyang as the Academician of the Chinese Academy of Science in 2017. As we all know, new energy vehicle (NEV) technologies have progressed greatly in recent years, especially in China. Professor Minggao Ouyang is one of the most famous scientists in China in this field. He has served for more than 15 years as the major consulting expert for the central government in developing NEVs. His research interests include design, diagnosis and control of advanced internal combustion engines, lithium batteries, polymer electrolyte membrane fuel cells, electric vehicles, hybrid vehicles, hydrogen fuel cell vehicles, and energy supply systems (battery charging and hydrogen stations) for NEVs. He won the Second Prize of National Award for Technological Inventions, the First Prize of Beijing Science and Technology Award, and the Science and Technology Award of the Ho Leung Ho Lee Foundation.

Compared to traditional vehicles with internal combustion engines, NEVs have advantages of high efficiency, low/zero emission and low noise. There are different types of NEVs, e.g., hybrid vehicle, battery electric vehicle and fuel cell vehicles. Although they have been developing very quickly for more than ten years, there are still great challenges in improving powertrain efficiency, safety and durability. Modelling, control and optimisation of these alternative powertrains are the basis for further development. This is also another reason why we plan to organise such a special issue.

This issue contains a collection of six original research papers world widely in this area. The six papers for this special issue were selected from among all the submitted papers, based on the relevance to the special issue and peer-review results. They cover a wide range of topics. Three papers discuss technologies about advanced internal combustion engines, one for modelling and estimating of lithium-ion battery, one for diagnosis of electric traction drives, and the last one for life cycle assessment of different options for sustainable mobility.

Researches on NEVs are just at the beginning stage. Along with the rapid development of new materials, novel power modules and advanced IT/BT/automotive electronics technologies, more creative innovations will arise, such as distributed electric drivetrains with high flexibility, lithium batteries with high safety, novel fuel cell systems (PEMFC or SOFC) with long durability, and intelligent control systems with new electric/electronic architectures. From the six papers, we are glad to observe that the advanced powertrain community is very actively in this field. We hope that the readers enjoy this special issue.