Editorial

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Biographical notes: Xiangyang Xu is a Professor of School of Transportation Science and Technology, Beihang University. He serves as a Fellow of SAE-China, an executive member of SAE-China, the Deputy Secretary-General for SAE-China of Gear Technology Branch, the Director of Beijing Key Lab for High Efficiency and System Control of New Energy

Resource Vehicle, and the Executive Deputy Director of National Engineering Research Center for Passenger Car Automatic Transmission. His research interests include transmission technology, hybrid and EV drive.

Kambiz Ebrahimi is a Professor of Advanced Propulsion in the Department of Aeronautical and Automotive Engineering at the Loughborough University. His main area of research is in system dynamics and control. Currently, he is involved in powertrain design and control research funded projects working with Ford Motor Company, AVL, Cummins, Jaguar and Land Rover. He was the recipient of the Ford Award for web-based condition monitoring for transfer-line drive systems in 1999. He is an organiser of Powertrain Modelling and Control Conference PMC2018.

Nong Zhang holds a professorial appointment and a position of the Director of Automotive Research Institute, Hefei University of Technology, China. For more than 30 years, he has been involved in teaching and research in areas of dynamics and control of automotive systems including vehicle powertrains with various types of transmissions, hybrid propulsion systems, vehicle dynamics, passive and active suspensions; range extended systems for EVs; and mechanical vibration including experimental modal analysis, rotor dynamics, cold rolling mill chatter and machine condition monitoring.

Karsten Stahl is Full Professor at the Institute of Machine Elements within the Department of Mechanical Engineering at the Technical University of Munich and the Director of the Gear Research Centre (FZG). His main research areas are power drive components, such as gears, synchronisation systems, multi-disc clutches and rolling bearings, and (electro-)mechanical drive systems. The focus of his investigations is on load capacity, efficiency, NVH/dynamic behaviour and EHL-/tribological contact.

In order to achieve the carbon peak and neutrality targets, China has released implementation plans for peaking carbon dioxide emissions in key areas and sectors, as well as a series of supporting measures. Advanced automotive powertrain technology is one of the most important directions of energy saving and emission reduction in automotive industry, which has received increasing attention.

It was under the above-mentioned background that Beihang University and *International Journal of Powertrains* (*IJPT*) jointly organised the '2021 International Conference on Advanced Vehicle Powertrains (ICAVP2021)' in Beijing, China with support from the school of transportation science and engineering of Beihang University between 2–4 September 2021. This conference is aiming to bring together industry and academic experts in the fields of vehicle powertrains and automation. In particular, it featured academic debates in advanced vehicle dynamics and control, innovative development technologies for transmission components, advanced modelling and control of electric drive system, advanced fault-tolerant control and analysis, advanced vehicle energy saving technologies, and hybrid technologies.

After voluntary submissions from ICAVP2021 authors and professional reviewer selection, six articles on a variety of topics relevant to this special issue have been accepted for publication. In this special issue, articles discuss advanced technologies in the field of automotive powertrain from a variety of theoretical, contextual and methodological perspectives.

Zi-Wei Wang, Shuai Gao and Jian-Ren Zhu in their article 'Influence of valve spool shoulder wall angle on steady-state hydraulic force' investigate the influence of angle at the shoulder of the main pressure regulating valve spool of a transmission hydraulic system on steady-state hydraulic force of slide valve, to improve the control precision and response speed of electro-hydraulic control system.

Dong Guo, Wenyi Rao, Yi Zhou, Yizhou Xiong and Yi Zhou 's article 'Experimental study on effect of torsional vibration attenuation measures for driveline with DCT' adopt dual-mass flywheel and clutch micro-slip control, which greatly reduce the angular acceleration amplitude of the input shaft.

Jin Zhao, Haiping Du, Donghong Ning, Huan Zhang, Lei Deng and Weihua Li, in their article 'Modelling of a magneto-rheological fluid dual clutch with BP neural network' present a backpropagation (BP) neural network model for a novel magneto-rheological fluid dual-clutch (MRFDC), and the experimental results show that the proposed model is able to predict the output torque capacity of the MRFDC precisely with dynamic input currents.

Xuewu Liu, Jiangling Zhao, Zhuochao Liu, Xiangyang Xu, Hongzhong Qi, Yongming Zhu, Peng Dong and Shuhan Wang's piece 'A hybrid electromechanical coupling system optimisation' focus on the comparisons of the single-motor hybrid system, the series-parallel hybrid system, the power-split hybrid system, and other different routes. At the same time, they systematically describe the whole process of scheme design.

Stefan Sendlbeck, Shiv Vipul Patel, Michael Otto and Karsten Stahl in their article 'Gear condition monitoring by augmenting measured transmission error data for gear damage and propagation estimation' propose an approach to augment measured transmission error data with simulated data to estimate the current degree of gear damage by comparing this simulated with the measured transmission error of the running gear transmission.

The last article is by Michael Otto, Stefan Sendlbeck and Karsten Stahl 'Real-time load spectrum analysis for lifetime prediction of e-mobility drivetrains' present an innovative strategy of combining load spectrum calculation and condition monitoring that adjusts the lacking precision of lifetime prediction.

I would like to thank the authors and reviewers for this special issue. I also want to thank for the support of *IJPT* in making ICAVP2021 and this special issue happen. I hope the automotive powertrain researchers will find this special issue to be an informative and useful collection of articles.