



TUTORIAL TUT02

2020 IEEE 19th International Power Electronics and Motion Control Conference (IEEE-PEMC 2020) offers tutorials planned to be organized on 20th of September 2020 on topics related to the conference scope.

Tutorial details

Tutorial title: Damping of torsional vibrations in mechatronic systems

Presenters (name, e-mail and affiliation)

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Tutorial abstract

With the growing demand for high performance drives the problem of precision control is a popular target for many universities and industrial researchers. Accurate control of mechatronic systems is a crucial point in different types of industry, starting from traditional conveyer and rolling-mill drives, paper machines, through robot arm drives, CNC machines, ending on MEMS (micro electromechanical systems), etc. During the design process of an advanced drive system all factors which can affect the performance of the control should be taken into consideration. The mechanical characteristics of the drive, especially the finite stiffness of the shaft, have to be included in the analysis. In designing the control structure this factors should be compensated by a suitable control algorithm. In this Tutorial, 3 speakers will give lectures about vibration control of motion systems using different control techniques.

Presenters biography

Krzysztof Szabat



Krzysztof Szabat received the Ph.D. and D.Sc. degrees from the Electrical Engineering Faculty of Wroclaw University of Technology, Wroclaw, Poland, in 2003 and 2008, respectively. In 2016 he was awarded with the title Professor of Technical Sciences. Currently he is Head of the Department of Electrical Machines, Drives and Measurements at Wroclaw University of Science and Technology. He is the author and coauthor of over 100 journal and conference papers. His main field of interest is the application of the control theory, artificial intelligence methods, and microprocessor techniques to motion control. Prof. Szabat had scientific/didactic stays in the universities in Germany, Ireland, UK, Croatia and Russia.

Seiichiro Katsura



Seiichiro Katsura (S'03-M'04) received his B.E. degree in system design engineering and his M.E. and Ph.D. degrees in integrated design engineering from Keio University, Yokohama, Japan, in 2001, 2002 and 2004, respectively.

From 2003 to 2005, he was a Research Fellow of the Japan Society for the Promotion of Science (JSPS). From 2005 to 2008, he worked at Nagaoka University of Technology, Nagaoka, Niigata, Japan. Since 2008, he has been at Department of System Design Engineering, Keio University, Yokohama, Japan. Currently, he is working as a Professor. In 2017, he was a Visiting Researcher with the Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University, Aachen, Germany. His research interests include applied abstraction, human support, data robotics, wave system, systems energy conversion, and electromechanical integration systems.

He has been active in the IEEE IES. He serves as Associate Editor of the IEEE Transactions on Industrial Electronics, Associate Editor of the IEEE Journal of Emerging and Selected Topics in Industrial Electronics, and Technical Editor of IEEE/ASME Transactions on Mechatronics. He is a Member of Technical Committees on Sensors and Actuators, and Motion Control. He is an author or a co-author of more than 152 journal papers, 420 international conference papers with review and 32 patents.

He was the recipient of The Institute of Electrical Engineers of Japan (IEEJ) Distinguished Paper Awards in 2003 and 2017, The European Power Electronics and Drives-Power Electronics and Motion Control Conference, (EPE-PEMC'08), Best Paper Award in 2008, IEEE Industrial Electronics Society (IES) Best Conference Paper Award in 2012, and JSPS Prize in 2016.

Tomasz Pajchrowski



Tomasz Pajchrowski received the Ph.D. degree and the D.Sc. degree in in control of electrical drives from Poznan University of Technology (PUT), Poznań, Poland, in 2005 and 2016, respectively.

He is currently an Assistant Professor with the Faculty of Control, Robotics and Electrical Engineering, PUT and deputy director of the Institute of Robotics and Machine Intelligence. He is an author and co-author of over 100 scientific papers and 1 patent. His research interests include control of synchronous permanent-magnet motors, especially control for Multi-Mass System With Variable Mechanical Parameters, where control systems, the nonlinear, adaptive, and robust control algorithms, as well as computational intelligence methods are applied.

Dr. Tomasz Pajchrowski is a Member of the Polish Society of Theoretical and Applied Electrical Engineering. He was a Member of the Local Organising Committee of the 13th Power Electronics and Motion Control Conference EPE-PEMC 2008, held in Poznań.

