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The Department of Automatic Control & Systems Engineering
is pleased to announce the following seminar:

The data driven based design and manufacturing of complex systems

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Wednesday, 04 November 2020 at 14:00

Via Google Meet

Host Academic: Professor Zi-Qiang Lang, ACSE

Abstract

In practice, design and manufacturing of structures and materials are usually conducted based on vast simulations or a deep understanding of their physics, but these become difficult if the structures and materials are nonlinear and complex. New approaches are therefore needed for industries to conduct efficient and accurate design and manufacturing of complex structures and materials, and the data driven approaches will be a paradigmatic solution to this issue. In this talk, I'll introduce a novel data driven design approach, which include (1) the identification of a type of data driven model, known as the NARX-M-for-D (Nonlinear Auto-Regressive with eXogenous inputs Model with design parameters for Design), of the system, and (2) the optimal design of system dynamics in the frequency domain based on the AOFRF (Associated Output Frequency Response Function) representation of the NARX-M-for-D identified in (1). A case study on the design of the Auxetic foam based isolation system will be discussed to demonstrate the application of the proposed method and its potential to be applied to solve a wide range of engineering system design issues.

Biography

Dr. Yunpeng Zhu received the B.S. and M.S. degrees in Mechanical Engineering and Automation in 2013 and 2015, respectively, from the Northeastern University, China. He recently received a PhD in Automatic Control and Systems Engineering in Sheffield University. He is currently a Research Associate specializing in the theories and methods for complex systems analyses and design and relevant applications in mechanical engineering and advanced manufacturing. In 2019, he was awarded the Chinese Government Award for Outstanding Self-financed Students Abroad. Only 500 PhD students were awarded over the world in that year. He was also the winner of the Best Student Paper Prize in 2019 1st International Conference on Industrial Artificial Intelligence. He has published over 30 international journal papers including some very top journals in the subject area of systems and control including Automatica and IEEE Transactions on Control Systems Technology, and has acted as a referee for over 10 high quality journals including Automatica, IEEE transactions on Automatic Control, IEEE transactions on Mechatronics, etc..