

講演会のご案内

Semi-active Control of Structural Systems Using Nonlinear Damping with Applications to Vibration and Building Isolations

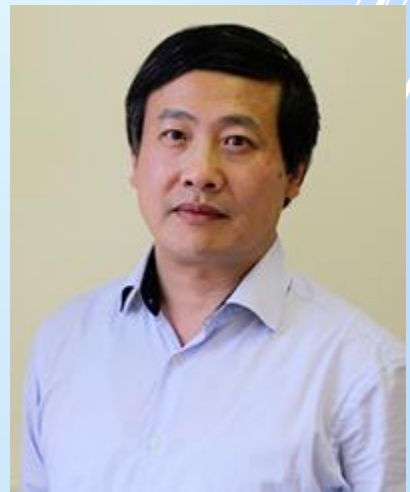
講師: Zi-Qiang Lang

(Professor, Department of Automatic Control and Systems Engineering, University of Sheffield. UK.)

日付: 2017年11月15日 11:00-12:30

場所: 4-656A 室

ABSTRACT: This talk will introduce the beneficial effects of nonlinear damping, and the semi-active control based implementation of nonlinear damping for vibration and building isolations. The beneficial effects of nonlinear damping on vibration isolation will be comprehensively demonstrated by theoretical analysis, simulation examples, and experimental studies. The application of nonlinear damping to building isolation will be shown by an experimental work on a physical building model to demonstrate its potential application in earthquake engineering. These works are based on the recent studies at Sheffield on the frequency domain analysis and design of nonlinear systems. The results will show the significances of these nonlinear system analysis and design tools in addressing important engineering problems.



BIOGRAPHY OF ZI-QIANG LANG

Professor Z Q Lang holds the Chair of Complex Systems Analysis and Design in the Department of Automatic Control and Systems Engineering, University of Sheffield. UK. His main research covers the development of theories and methods in system modelling, analysis, design and signal processing, and the application of these in a wide range of engineering and scientific research areas. He has published more than 100 quality journal papers and, as PI, completed many research projects supported by UK EPSRC, Royal Society, TSB, and EU. In recent ten years, he has initiated a new research field known as output frequency response based nonlinear system analysis and design and proposed many new concepts and methods in this area. The achievements include the derivation of the output frequencies of nonlinear systems, the proposal of the concepts of Nonlinear Output Frequency Response Functions (NOFRFs) and Output Frequency Response Function (OFRF), and the development of the NOFRFs and OFRF based methodologies for nonlinear system analysis and design. These unique works have been recognised by experts including UK EPSRC grant outcome assessment panel as world leading and having resolved decade old problems in relevant areas. The application of these novel nonlinear system analysis and design to vibration and building isolations is one of important research areas of Prof Lang's research team at Sheffield. This research study is partly motivated by Prof Lang's collaborative works with the scientists at Kyoto and Keio Universities where Prof Lang worked for one month in 2013 under the support of the JSPS Short Term Invitation Fellowship for Research in Japan.