

Einladung des Instituts für Regelungs- und Automatisierungstechnik
zum GASTVORTRAG am 01.12.2017 um 13:00 Uhr
im Seminarraum IRT, INK1063, Inffeldgasse 21B/1. KG, 8010 Graz

Title: **Analysis of discontinuous control systems by LPRS method**

Lecturer: **Prof. Igor BOIKO**, The Petroleum Institute, Abu Dhabi, United Arab Emirates

Abstract:

Discontinuous control systems, such as relay feedback and sliding mode control systems, constitute an important class of nonlinear control systems. They can reveal various nonlinear phenomena: periodic motions, sliding modes, chaos. Among those, symmetric and asymmetric self-sustained periodic motions as well as periodic motions modulated by low-frequency input signals are most relevant to practical applications. The locus of a perturbed relay system (LPRS) method is a frequency-domain method that allows one to find self-sustained periodic motions and the reaction of a discontinuous system having oscillations to an external input signal. The LPRS method is presented starting from the underlying concepts to computing formulas, and to examples of application.

Biography:

Igor Boiko has MSc, PhD and DSc (Habil.) degrees in electromechanical engineering and control system engineering. He is currently a Professor with Electrical and Computer Engineering department of Khalifa University of Science and Technology, Abu Dhabi, UAE. He is also a head of the Intelligent Systems, Sensing and Control research lab of the ADNOC Research and Innovation Centre. He has known for his research contributions in the areas of discontinuous control, sliding mode control, frequency-domain methods and PID controller tuning. In particular, he developed such methods and concepts as LPRS method, dynamic harmonic balance, phase deficit, fractal dynamics, and optimal non-parametric controller tuning. Over his career, Dr. Boiko led research projects in the areas of control of various process systems in the oil and gas industry, control of pneumatic and electric servomechanisms and drives, unmanned aerial vehicle control, electric vehicle control, power converter control, optimal PID tuning. He also worked for 15 years in the petrochemical industry and held leading positions in control system development on such multi-billion projects as Syncrude UE-1 and Shell Albion Sands (both in Alberta, Canada). He has authored/co-authored four books and a number of journal and conference papers. Dr. Boiko is a Fellow (Academician) of Russian Academy of Natural Sciences.