1st joint seminar on non-linear and adaptive dynamical systems

IPPT PAN and Division of Dynamics (Lodz University of Technology)

April 11th, 2017

(IPPT PAN, Scientifc Council Room, 1st floor)

10:20 – 10:30 Łukasz Jankowski (IPPT)
Welcome to Department of Intelligent Technologies, IPPT PAN

10:30 – 10:40 Przemysław Perlikowski (DoD)
Scientific topics in Division of Dynamics, Lodz University of Technology

10:40 – 11:10 Piotr Brzeski (DoD)
Dynamics of church bell a hybrid dynamical system[i, ii, iii]

11:10 – 11:40 Mateusz Lazarek (DoD)
Tuned mass damper with inerter that enables changes of inertance[iv, v vi, vii]

11:40 – 12:10 Dawid Dudkowski (DoD)
Perpetual points in dynamical systems [xxxiii]

12:10 – 12:30 Błażej Popławski (IPPT)
Decentralized semi-active damping of free structural vibrations using on/off truss–frame nodes[viii, ix, x]

12:30 – 13:00 Coffee break

13:00 – 13:30 Piotr Brzeski (DoD)
Basin stability method – a new method to analyse dynamical systems[xi], [xii]

13:30 – 13:50 Tomasz Szmidt (IPPT)
Shear deformation damping of a double-beam structure[xiii]

13:50 – 14:10 Dominik Pisarski (IPPT)
Decentralized control of semi-active vibrating structures[xiv]

14:10 – 14:40 Grzegorz Mikułowski, Rami Faraj (IPPT)
Investigation on semi-active and semi-passive pneumatic absorbers[xv, xvi, xvii]

14:40 – 15:00 Cezary Graczykowski (IPPT)
The concept and applications of Adaptive Inflatable Structures[xviii, xix, xx]

[i] P. Brzeski, T. Kapitaniak, P. Perlikowski, ”Experimental verification of a hybrid dynamical model of the church bell”, International Journal of Impact Engineering 80

[ii] P. Brzeski, T. Kapitaniak, P. Perlikowski, “Analysis of transitions between different ringing schemes of the church bell”, International Journal of Impact Engineering 85

[iii] A.S.E. Chong, P. Brzeski, M. Wiercigroch, P. Perlikowski, “Path following bifurcation analysis of church bell dynamics”, Journal of Computational and Nonlinear Dynamics, accepted for publication

[iv] P. Brzeski, T. Kapitaniak, P. Perlikowski, ”Novel type of tuned mass damper with inerter which enables changes of inertance”, Journal of Sound and Vibration 349

[v] P. Brzeski, P. Perlikowski, “Effects of play and inerter nonlinearities on the performance of Tuned Mass Damper”, Nonlinear Dynamics

[vi] P. Brzeski, M. Lazrek, P. Perlikowski, “Experimental study of the novel tuned mass damper with inerter which enables changes of inertance”, Under Review

[vii] M. Lazrek, P. Brzeski, P. Perlikowski, “Novel tuned mass damper with inerter which enables changes of inertance – description of experimental rig”, in preparation

[viii] B. Popławski, G. Mikułowski, Ł. Jankowski, “On-off damping of free vibrations and optimum actuator placement”, 40th Solid Mechanics Conf. (SolMech 2016), 28 August - 2 September 2016, Warsaw, Poland.

[ix] B. Popławski, C. Graczykowski, Ł. Jankowski, “Controllable Truss-Frame Nodes in Semi-Active Damping of Vibrations”, Advances in Science and Technology 101, 2016, pp. 89-94.

[x] A. Mróz, J. Holnicki-Szulc, J. Biczyk, “Prestress Accumulation-Release Technique for Damping of Impact-Born Vibrations: Application to Self-Deployable Structures”, Mathematical Problems in Engineering, Vol.2015, id.720236, 2015

[xi] P. Brzeski, M. Lazarek, T. Kapitaniak, J. Kurths, P. Perlikowski, “Basin stability approach for quantifying responses of multistable systems with parameters mismatch”, Meccanica 51(11)

[xii] P. Brzeski, J. Wojewoda, T. Kapitaniak, J. Kurths, P.Perlikowski “Can sample-based approach outperform the classical dynamical anaysis? - experimental confirmation of the basin stability method”, Under Review

[xiii] T. Szmidt, “Shear deformation damping of a double-beam structure”, Journal of Sound and Vibration, Vol.370, pp.163-175, 2016

[xiv] D. Pisarski, “Decentralized stabilization of semi-active vibrating structures”, Journal of Sound and Vibration, under review

[xv] G. Mikułowski, R. Wiszowaty, “Pneumatic Adaptive Absorber: Mathematical Modelling with Experimental Verification”, Mathematical Problems in Engineering, Vol.2016, id.7074206, 2016

[xvi] G. Mikułowski, R. Wiszowaty, J. Holnicki-Szulc, “Characterization of a piezoelectric valve for an adaptive pneumatic shock absorber”, Smart Materials and Structures, Vol.22, No.12, id.125011, 2013

[xvii] R. Faraj, C. Graczykowski, K. Hinc, J. Holnicki-Szulc, L. Knap, J. Seńko, “Adaptable pneumatic shock-absorber”, [to appear in:] VIII ECCOMAS Thematic Conference on Smart Structures and Materials SMART 2017 (A. Güemes, A. Benjeddou , J. Rodellar and Jinsong Leng, Eds)

[xviii] C. Graczykowski, J. Holnicki-Szulc, “Crashworthiness of Inflatable Thin-Walled Structures for Impact Absorption”, Mathematical Problems in Engineering, Vol.2015, id.830471, 2015

[xix] C. Graczykowski, “Mathematical models and numerical methods for the simulation of adaptive inflatable structures for impact absorption”, Computers and Structures, Vol.174, pp.3-20, 2016

[xx] C. Graczykowski, J. Holnicki-Szulc, “Protecting offshore wind turbines against ship impacts by means of Adaptive Inflatable Structures”, Shock and Vibration, Vol.16, No.4, pp. 335-353, 2009

[xxiii] D. Dudkowski, A. Prasad, and T. Kapitaniak. "Perpetual points and hidden attractors in dynamical systems." *Physics Letters A* 379.40 2591-2596, 2015.