RIMS Workshop on

New Directions in Applied Dynamical Systems

Organizer: Hiroshi Kokubu (Kyoto University)

Dates: March 10 (Monday) – 14 (Friday), 2014

Place: Room 420, Research Institute of Mathematical Sciences, Kyoto University

URL: https://www.math.kyoto-u.ac.jp/workshop/crest-sbm/index.html

PROGRAM

March 10 (Mon) 13:00-13:10 **Opening Remarks** 13:10-13:55 Alan Champneys (University of Bristol, UK) The dynamics of valve rattle 14:05-14:50 Shinya Aoi (Dept. Aeronautics & Astronautics, Kyoto U) Locomotion dynamics and control in humans and animals 15:10-15:30 Ippei Obayashi (Dept. Math., Kyoto U) Construction of the basin of attraction for simple bipedal walking models by the hyperbolicity of inverted pendulum Kazuvuki Yagasaki (Dep. Math., Hiroshima U) 15:35-16:20 Melnikov Processes and Chaos in Randomly Perturbed Dynamical Systems March 11 (Tue) Alan Champneys (University of Bristol, UK) Bifurcations in a dynamic auto-balancer for unstable rotors

10:00-10:45

10:55-11:15 Katsutoshi Shinohara (FIRST Aihara Project, JST, U Tokyo)

Beta Encoder: Mathematical Analysis of its Robustness

Kazuyuki Aihara (Institute of Industrial Science, U Tokyo) 11:20-12:05 Applications of Dynamical Systems Theory to Personalized Medicine

14:00-14:45 Yoshihiko Susuki (Dept. Electrical Engineering, Kyoto University) Applied Nonlinear Dynamics in Energy Systems Technology

James Wright (University of Surrey, UK) 14:55-15:15

The effects of time dependent dissipation on basins of attraction

Tomoyuki Miyaji (RIMS, Kyoto U) 15:35-15:55

Computer-assisted analysis on four-leaf orbits of Craik's 3D dynamical system

16:00-16:45 Mike Jeffrey (University of Bristol, UK)

Nonsmooth dynamics: the first 500 years

| March | 12 | (Wed) |
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10:00-10:45 Mike Jeffrey (University of Bristol, UK)

New horizons in piecewise-smooth dynamics

10:55-11:15 Wen-Guei Hu (National Chiao Tung University, Taiwan)

Pattern generation problems arising in multiplicative integer systems

11:20-12:05 Toshiyuki Ogawa (Grad. School Advanced Math. Sciences, Meiji U) Instability of periodic traveling wave solutions to excitable RD systems

14:00-14:45 Thomas Wanner (George Mason University, USA)

Stochastic Dynamics of Droplet Formation

14:55-15:15 Kaiichiro Ota (Dept. Appl. Analysis & Complex Dyn. Sys., Kyoto U)
Analyzing rhythmic data using dynamical systems theory and Bayesian statistics

15:35-15:55 Takaaki Aoki (Faculty of Education, Kagawa U)

Organization of complex networks as a dynamical system

16:00-16:45 Tomas Gedeon (Montana State University, USA)

State space reconstruction and causal inference

18:00- Workshop dinner

March 13 (Thr)

10:00-10:45 Thomas Wanner (George Mason University, USA)

Multistability in the Diblock Copolymer Model

10:55-11:40 Pawel Pilarczyk (University of Minho, Portugal)

Automatic classification of global dynamics in flows with parameters

14:00-14:45 Konstantin Mischaikow (Rutgers University, USA / RIMS)

A combinatorial approach to dynamics applied to switching networks

14:55-15:15 Hidetoshi Morita (Dept. Math., Kyoto U)

Application of a topological-computation method to meteorological data

15:35-15:55 Hiroe Oka (Dept. Applied Math. & Informatics, Ryukoku U)

Detecting Morse decompositions of the global attractor of regulatory networks by time series data

16:00-16:20 Shaun Harker (Rutgers University, USA)

Space-efficient Algorithms for Computational Dynamics a la Conley-Morse Database

March 14 (Fri)

10:00-10:45 Frederic Chazal (INRIA, France)

Persistence stability for geometric complexes

10:55-11:15 Kelly Spendlove (Rutgers University, USA)

Persistent Topological Analysis of Human Red Blood Cells and Flickering

11:25-12:10 Yasuaki Hiraoka (Inst. Math. for Industry, Kyushu U)

Persistence of Common Topological Structures by a Commutative Triple Ladder Ouiver

12:20-13:05 Frederic Chazal (INRIA, France)

Statistical properties of persistence diagrams in Topological Data Analysis