MODELLING, SIMULATION AND COMPUTER-AIDED DESIGN IN ENGINEERING AND MANAGEMENT WORKSHOP

6th of December 2017, University of Pécs, Faculty of Engineering and Information Technology, Pécs, Boszorkány Street 2, Room B124

13.00 – 13.15 Opening of the workshop

prof. dr. Bálint Bachmann, Dean of University of Pécs, Faculty of Engineering and Information Technology, Hungary

prof. dr. Péter Iványi, Vice-Dean of University of Pécs, Faculty of Engineering and Information Technology, Hungary

Ildikó Perjési-Hámori, Ceepus partner coordinator of CEEPUS CIII-BG-1103 network, University of Pécs

13.15 – 13.45 Chaos in combinational and sequential logic systems

Peter Planinšič, University of Maribor, Faculty of Electrical Engineering and Computer Science, Slovenia,

13.45 – 14.30 Developing High Quality Question Bank in Maple T.A. *György Maróti, University of Pannonia, Hungary*

14.30 – 15.00 Education and research in numerical modeling and simulation at the Faculty of mechanical engineering, University of Osijek

Dražan Kozak, Vjekoslav Šimunović Mechanical Engineering Faculty in Slavonski Brod Josip Juraj Strossmayer University of Osijek, Croatia

15.00 – 15.30 Coffee break

15.30 – 16.00 These en cotutelle in modelling, simulation and computer-aided design in engineering and management, possibilities for FIS

Blaž Rodič, Faculty of Information Studies Novo mesto, Slovenia

16.00 – 16.30 Scientific and academic capacity of Faculty of Automatic (FA), Technical University of Sofia

Vladislav Slavov, Technical University of Sofia, Faculty of Automatics, Bulgaria

16.30 – 16.45 The role of UBT in the Joint program "These en cotutelle" in the framework of the CEEPUS network.

Edmond Hajrizi, UBT, Pristina, Kosovo

16.45 – 17.30 Planning the activities in CEEPUS network "Modelling, Simulation and Computer-aided design in Engineering and Management" and the Progress in Joint Program Thèse en Cotutelle

Galia Marinova, Technical University of Sofia, Faculty of Telecommunications, Bulgaria

MODELLING, SIMULATION AND COMPUTER-AIDED DESIGN IN ENGINEERING AND MANAGEMENT

WORKSHOP

6th of December 2017,
University of Pécs, Faculty of Engineering and Information Technology,
Pécs, Boszorkány Street 2, Room B215

Abstracts

Chaos in combinational and sequential logic systems

Peter Planinšič, University of Maribor, Faculty of Electrical Engineering and Computer Science, Slovenia,

The appearance of chaotic behaviour is well known in nonlinear continuous and discrete time dynamics systems. However it appears also in combinational and sequential logic systems and circuits. The determination of error bounds for reliable fault tolerant computations is very important, especially by implementation of this systems in emerging nanotechnology. The analysis of such systems with noisy components, i.e. gates is possible from bifurcation theory point of view, which is the rout to chaos in nonlinear dynamic systems, is nowadays increasing.

In this lecture we will shortly review the chaos in discrete nonlinear maps. We will also review some basics of combinational and sequential logic circuits. Than we will show that approach with discrete nonlinear maps is possible for worst case operations of faulty gates under von Neumann's probabilistic computing framework. Also the possibility for extension of this approach from NAND gates as basic building blocks to other types of gates and systems will be discussed. Simulations in Matlab / Simulink will be presented.

References:
[1] J. Gao, Y, Caos, W.-W. Tung and J. Hu, *Multiscale analysis of complex time series.* John Wiley & Sons, 2007.
[2] J. Gao, Y. Qi and Jose A. B. Fortes, Bifurcations and Fundamental Error Bounds for Fault-Tolerant Computations, *IEEE Transactions on Nanotechnology*, Vol. 4, No. 4, July 2005, pp. 395-402.
[3] J. Von Neumann, Probabilistic logics and the synthesis of reliable organisms from unreliable components, in Automata Studies (edited by C. E. Shannon and J. Mc-Carthy). Princeton University Press), pp. 43-98.
[4] J. K. Peckol, *Embedded systems. A Contemporary Design Tool*, John Wiley & Sons, 2008.

Developing High Quality Question Bank in Maple T.A.

György Maróti University of Pannonia, Hungary

On-line measurement of knowledge becomes more and more important aspect of teaching activity. Based on the mathematical engine of Maple the test system MapleSoft Ltd.. offers the possibility to plan and develop sophisticated questions including among others Maple Graded and Math App type questions. Maple Graded question gives the total freedom to write algorithms for evaluation of the students response, while Math App question allows to insert complete Maple worksheet into the question text. This feature results in attractive question interface with different embedded objects like sliders, buttons, plot and text areas and much more. In

this lecture we give a short overview of these possibilities and present several examples to demonstrate the high quality features of Maple T.A. system.

These en cotutelle in modelling, simulation and computer-aided design in engineering and management Possibilities for FIS
Blaž Rodič, Faculty of Information Studies Novo mesto, Slovenia

Syllabi for These en cotutelle programme, Simulation and modelling in the curricula, Available dissertation themes, Legal framework for joint PhD programs in Slovenia, National situation for new PhD programs in Slovenia, Conditions for joint programs.

Scientific and academic capacity of Faculty of Automatic (FA), Technical University of Sofia
Vladislav Slavov, Technical University of Sofia, Faculty of Automatics, Bulgaria

Faculty of Automatics is one of the oldest and biggest Faculties in the Technical University of Sofia (TUS_.Its staff includes more than 70 teachers. The structure of the faculty is based on 5 departments covering education and research work on different fields of automation and control systems. Every year FA educates more than 400 students in bachelor and master degrees and offers several of PhD programs. Fa offers education in English, full time and part time education. The members of the faculty are active in participating in research projects funded by TUS, the Ministry of Education and Science as well as European programs. FA is always opened to collaboration with new partners from and out of EU in terms of developing educational programs and participation in scientific projects.

Planning the activities in CEEPUS network "Modelling, Simulation and Computer-aided design in Engineering and Management"
and the Progress in Joint Program Thèse en Cotutell
Galia Marinova, Technical University of Sofia, Faculty of Telecommunications, Bulgaria

The presentation is focused on planning the activities for the second term of the current academic year 2017/2018 and these for the next academic year 2018/2019.
The second aspect of the presentation is the state-of-the art of the Joint program Thèse en Cotutelle and the potential Ph.d. students candidates.
Certain aspects of the web site of the network, the reports in the central CEEPUS site and potential new project applications are also considered.