Rozszerzony plan otwartych seminariów nauczycieli akademickich goszczących w Politechnice Rzeszowskiej w maju i czerwcu 2009:

Koordynator cyklu seminariów: Dr inż. Sławomir Samolej Katedra Informatyki i Automatyki Politechniki Rzeszowskiej Email: <u>ssamolej@prz-rzeszow.pl</u> WWW: <u>http://ssamolej.prz-rzeszow.pl</u> Tel: 17 865 1481

1)	
Termin:	27.05.2009
Miejsce:	Zespół Budynków Politechniki Rzeszowskiej przy ul. W. Pola,
	Budynek E, Sala E1;
Godzina:	13.30;
Prelegent:	Kadim Tasdemir PhD, Yasar University, Izmir, Turcja;
Temat:	Detailed knowledge discovery from high-dimensional data
	with Self-Organizing Maps;

Streszczenie:

High-dimensional data is increasingly becoming common because of its rich information content that can potentially provide comprehensive characterization of the objects (structures) in real world situations. These data, such as hyperspectral images and genetic microarray data, usually have many meaningful clusters, including interesting rare ones, whose discovery may be of great importance. Yet, capturing intricate structure may be impossible and rare clusters may be undiscovered due to limitations of clustering methods. A powerful method in high-dimensional data analysis is the use of Self-Organizing Maps (SOMs). SOMs have a self-organized learning algorithm that quantizes data spaces and provide spatially ordered placement of quantization prototypes on a rigid lattice. These properties provide information, which can be exploited to extract precise cluster structure either by explanatory visualization or by clustering the SOM prototypes. This talk will present recent advances in visualization and automated clustering schemes for SOMs, which can help detailed knowledge discovery from high-dimensional data where conventional methods may be inadequate.

Biografia prelegenta:

Kadim Tasdemir received his B.S. degree in Electrical and Electronics Engineering from Bogazici University, Istanbul, in 2001, his M.S. degree in

Computer Science from Istanbul Technical University, in 2003, and his Ph.D. degree in Electrical and Computer Engineering from Rice University,

Houston, TX, in 2008. His research during his PhD was funded by NASA projects. Currently, he is an Assistant Professor of Computer Engineering at Yasar University, Izmir. His research interests include detailed knowledge discovery from high-dimensional large data, especially multi- and hyperspectral imagery, artificial neural networks, self-organized learning, data mining and pattern recognition.

2)	
Termin:	03.06.2009
Miejsce:	Zespół Budynków Politechniki Rzeszowskiej przy ul. W. Pola,
	Budynek E, Sala E1;
Godzina:	13.30;
Prelegent:	Mark Ghijs, Katholieke Hogeschool Zuid-West-Vlaanderen Kortrijk,
	Kortrijk, Belgia;
Temat:	Remote control with PDA and Webservices.
Uwaga:	Dla zainteresowanych osób będzie możliwe odbycie praktycznych zajęć
	laboratoryjnych z omawianej tematyki.

Streszczenie:

How to write a program to communicate between a pc and a micro controller trough USB. Extending the existing program with a web service using c# Visual studio 2008 and building a client application that consumes this Web service. examples :

1) reading usb input (switches, analogue values) and writing to usb (leds)

- 2) iwii wii using a accelerator sensor
- 3) consuming a existing web service on the internet
- 4) writing your own web service

5) programming the PDA

6) writing to the USB Board with the PDA using a web service

Biografia prelegenta:

After his studies of industrial engineer and his military service, Mark Ghijs has been teaching since 1992 and at Katho since 1999, the topics he teaches right now are automation, digital electronics (VHDL) and software design.

3)	
Termin:	10.06.2009
Miejsce:	Zespół Budynków Politechniki Rzeszowskiej przy ul. W. Pola,
-	Budynek E, Sala E1;
Godzina:	13.30;
Prelegent:	Reggie Davidrajuh PhD, University of Stavanger, Norwegia;
Temat:	Developing a New Petri net Tool for Simulation of Discrete Event Systems.

Streszczenie:

This talk is about developing a new Petri net simulator. The reasons for developing a new simulator are:

- 1. Flexibility: the simulator should enable easy integration with other libraries and tools, so that developing hybrid models (e.g. Fuzzy Petri nets, by integrating Petri net with Fuzzy Logic) becomes easy
- 2. Extensible: the simulator should enable users writing their own extensions, either extending or rewriting the existing functions or developing new functions.
- 3. Easy of use: for those who doesn't want to use mathematics when developing a model, the tool should provide a natural language user interface, so that the mathematical details are abstracted away from the user.

General-purpose Petri net simulator (GPenSIM, 2009) was developed to satisfy the three requirements stated above (flexible, extensible, and ease of use). GPenSIM is realized as toolbox for the MATLAB platform, so that diverse toolboxes that available in the MATLAB environment (e.g. Fuzzy Logic Toolbox, Control Systems Toolbox) can be used in the models that are developed with GPenSIM.

3-Layered Architecture

GPenSIM was built following 3-layer architecture. The bottom layer deals with Petri net run-time dynamics; this layer computes new states with the help of linear algebraic equations and matrix manipulations. The middle layer adds more high-level functionality such as stochastic timing, coloring tokens, user-defined conditions ('guard-conditions' in some literature), etc. The top layer offers applications such building a Petri net based model, running simulations, determining coverability tree, printing the simulation results, etc.

File based Model

A model of a discrete event system developed with GPenSIM consists of a number of files. The main simulation file (MSF) is the file that will be run directly by the MATLAB platform. In addition to the main simulation file, there will be one or more Petri net definition files (PDFs); definition of a Petri net graph (*static* details) is given in the Petri net Definition File. There may be a number of PDFs, if the Petri net model is divided into many modules, and each module is defined in a separate PDF. While the Petri net definition file has the static details, the main simulation file contains the dynamic information (such as initial tokens in places, firing times of transitions) of the Petri net. In addition to these files (main simulation file and Petri net definition files), there can be a number of transition definition files (TDFs) too.

A transition definition file consists of additional conditions that determine whether an enabled transition can fire or not. The additional conditions are called 'user defined condition' in GPenSIM terminology, whereas in some other literature (e.g. Colored Petri Net (CPN)) it is referred to as 'guard-functions'). There can be a separate transition definition file for each transition in a Petri net model.

Natural Language Interface

Users need not know Petri net mathematics when creating a Petri net model of a discrete event system. GPenSIM offers a natural language interface with which model building mainly deals with identifying the basic elements of a system and establishing the connections between these elements.

Figure-1 shows the architecture of GPenSIM.



Figure 2: The architecture of GPenSIM

Application Example

The talk will also include a case study on the application of GPenSIM for modeling and simulation of discrete event systems.

REFERENCE

GPenSIM (2009) http://www.davidrajuh.net/gpensim

Biografia prelegenta:

Reggie Davidrajuh received a Masters Degree in Control Systems Engineering in 1994 and a PhD in Industrial Engineering

in 2000, both from the Norwegian University of Science and Technology

(NTNU). He is currently an Associate Professor of Computer Science

at the Department of Electrical and Computer Engineering at

Stavanger University College, Norway.

He is the editor of the journal "International Journal of Business

Systems Research" and an associate editor of the journal "Electronic Government : an International Journal". In addition, he serves in the editorial committees of more than 10 journals. He has also organized many international conferences. His current research interests include: e-commerce, agile virtual enterprises, discrete event systems and modeling of distributed information systems. His home page is: http://www.davidrajuh.net/reggie