

**Annual Report of the
McLeod Institute of Simulation Sciences Hungarian Center**

Center Postal Address:

Budapest University of Technology and Economics
Faculty of Economic and Social Sciences
Department of Information and Knowledge Management
H-1111 Budapest
Sztoczek u. 4.
Hungary

Center Director:

Prof. Andras JAVOR Ph.D.,D.Sc.

Center Phone:

+36 1 4631987

Center Fax:

+36 1 4634035

Center E-mail:

javor@eik.bme.hu

Center Web Address:

www.itm.bme.hu/mcleod

Research Activities & Projects

The methodological research in applying AI in simulation by using intelligent demons (a special class of high level agents) and Knowledge Attributed Petri Nets (KAPN) is continued. The application of simulation is aimed at various fields and especially to interdisciplinary, economic and conflict resolving problems.

We have been active in a research project lasting 3 years (2002-2004) sponsored by the Hungarian Scientific Research Fund. The topic of the project is: "Investigation of

Intelligent – Mobile and Static – Agent Controlled Simulation Methodologies for Multidisciplinary Problem Solving”.

We participate in a EU project of the 6th Framework program dealing with the simulation of traffic.

Furthermore we are participating in the “USE-eNET (US-Europe e-Learning NETwork in Science and Engineering): An International Experiment in Modelling and Simulation Education” Transatlantic project coordinated by the universities of Chico and Hamburg.

We are working on an EU project proposal in cooperation with the Genova MISS Center (project coordinator) and other MISS centers on the promotion of SMEs by simulation where we play a decisive scientific role.

Education

The simulation courses taught by the personal of the Hungarian MISS Center:

At the Budapest University of Technology and Economics:

- Modeling and Simulation in Economy
- Promoting Decision Making and Management by Simulation
- Methodology of Simulation and their Application in Decision Making
- Modeling and Simulation for Decision Making in Economy

There are 6 Ph.D. students working on their thesis at the Hungarian MISS Center. They are actively taking part in the different research projects.

Center publications

- Javor, A., Meszaros-Komaromy, G.: Model Reconstruction of Soft System using Intelligent Agents
5th EUROSIM Congress on Modeling and Simulation, Paris, France, September 6-10, 2004.
- Javor, A.: Postgraduate Education in Simulation Sciences
Summer Simulation Conference, San Jose, California, July 25-29, 2004. 116-120.
- Javor, A.: Model Identification and Reconstruction by Intelligent Agent Controlled Simulation
Control Science and Infocommunication, Universitas-Gyor Kht., Gyor, 2005. 81-87. (in Hungarian)
- Javor, A.: Simulation of Soft Systems - Keynote lecture
Informatics 2005, Bratislava, Slovak Republic, June 20-21, 2005
(in publication)
- Javor, A.: Model Identification using Intelligent Agents
17th European Simulation Symposium and Exhibition, Marseille, 2005
(in publication)
- Mesaros-Komaromy, G.: Simulation-based Choice of Strategies in the Development of Regions

- ICCMSE 2004 Conference, Athen, Greece, November 19-23, 2004. 383-386.
- Szucs, G.: Optimization of Manufacturing Logistic by Simulation
Logisztika, Vol. IX., No. 2., 2004. March, pp. 41-51. (in Hungarian)
- Szucs, G.: Logistic-management using Simulation
Logistics, Information Management, Software Technology, Budapest
University of Technology and Economics, Department of Information and
Knowledge Management, Budapest, March, 2004. 21-31. (in Hungarian)
- Szucs, G.: Decision Methods in Point of View of their Applications
Tanulmányok az információ- és tudásfolyamatok világából 8., Budapest
University of Technology and Economics, Department of Information and
Knowledge Management, Budapest, September 2004. 23-35. (in Hungarian)
- Szucs, G.: Universal Intelligent Demon Structure with Various Knowledge Bases for
Optimum Determination
Selected Papers from the Alma Mater Series 1-8., Budapest University of
Technology and Economics, Department of Information and Knowledge
Management, Budapest, September, 2004. 1-18.
- Szucs, G.: Solutions of Cooperative and Non-Cooperative Problems by Intelligent
Agents in Simulation
International Mediterranean Modelling Multiconference, Bergeggi, Italy,
October 28-30, 2004, 365-369.

Center simulation tools

The main tool we apply in our research projects as well as in education is the AI controlled simulation system CASSANDRA (Cognizant Adaptive Simulation System for Applications in Numerous Different Relevant Areas) 3.0 we have developed in the recent years. (The CASSANDRA system has been applied in numerous international projects in various fields of application and its main features are outlined in the courses taught as mentioned above.)

Another tool is the PASION simulation system developed at the MISS Center of Mexico and provided by courtesy of Prof. Dr. Stanislaw Raczynski director of the Center.

By the courtesy of Prof. Dr. Bernd Schmidt from the University of Passau we have obtained the simulation system SIMPLEX II as freeware.

Beyond CASSANDRA 3.0 developed by us we have already used the other two software systems as well.

By courtesy of Incontrol Simulation Software BV we have received the student version of their simulation tool Enterprise Dynamics.

The hardware configurations on which our simulation softwares run are PCs and Workstations.

Center highlights

The Center intends to combine basic research of simulation methodologies coupled tightly with applications in various fields. Our approach is that we aim at finding solutions to problems arising in practical problem solving where the existing solutions are inadequate. In the past we have been participating in various projects, that we intend to continue. On the other hand we intend to get the students involved in the research work.

The main area of simulation we are active in is discrete simulation combined with artificial intelligence. The possible field of applications is rather wide. There are however some areas in which we already have been active or intend to be active in the near future. These priority areas are; flexible manufacturing systems, traffic, logistics, conflict resolution, micro and macro economy, development of regions, advising SMEs strategy selection by means of simulation. We are however open to undertake simulation in other application fields as well where our expertise and tools can be applied efficiently.

The direction in which we intend to work is the simulation of ill-defined systems with particular emphasis on economic and multidisciplinary problems. Our approach where we expect new results is the solution of the model reconstruction problem where our demon (agent) controlled simulation system can be applied with success and new scientific and practical results can be expected. Our first results have already been obtained in the field of the development of regions mentioned already above among the projects.

Budapest, June 14, 2005.

Prof. Andras Javor Ph.D.,D.Sc.
Director of the Hungarian MISS Center