# Conference program SIMS 2003

## September 18-19, 2003 Conference SIMS 2003 at Malardalen University, Vasteras (close to city center)

## Thursday September 18, 2003

**08.30- 09.30 Registration, coffee outside Hall Omega Hall Omega**

**09.30-09.45 Welcome speech, Opening of conference, Peter Fritzon, Chairman of SIMS**

### Keynote speeches and Discussion

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| 09.45- 10.30 | *ABB´s research activities in the automation field* <br> by Dr. Charlotte Brogren, research director ABB Corporate Research, Vasteras, Sweden |
| 10.30- 11.15 | *Neural Networks in System Identification and Forecasting - Principles, Techniques, Applications* <br> by Dr. Hans Georg Zimmerman, Senior Principal Research Scientist Siemens AG, Corporate Technology, Munich |
| 11.15-12 | *Graphical languages for decision support systems* <br> by Professor Finn Jensen, Aalborg University, Denmark |
| 12-12.30 | *Discussion on "the use of simulation and modeling in the future"* <br> Discussion leader Erik Dahlquist |

## 12.30- 13.30 Lunch

**Sessions 13.30- 17.30 Session 1a in Hall "Delta", Session 2a in Hall "Pi"**

### 15- 15.30 Coffee break

**Session 1a: Simulation systems and general methods, Chairman Peter Fritzon**

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| 13.30 | *Automatic Dimensional Consistency Checking for Simulation Specifications* <br> by Mikael Sandberg, Daniel Persson, Bjorn Lisper, Mälardalen University, Computer science department, Sweden |
| 14.00 | *Rag Doll Physics* <br> by A. Lombardi, M. Hennix, P. Hugoson, G. Johansson, T. Miljevic, A. Nilsson, M. Wassborn, Linkoping University, Sweden |
| 14.30 | *Dr Modelica* <br> by Susanna Monemar, Eva-Lena Lengquist Sandelin, Peter Fritzson, Peter Bunus PELAB, Department of Computer and Information Science, Linkoping Univ., Sweden |

**15.00 – 15.30 Coffe break**

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| 15.30 | *Enhancing distributed simulation systems by using modern technologies* <br> by Andreas Kvarnström, Baharak G. Fard, Jari Ala-Kurikka, Ivica Crnkovic, Computer science Dept., Mälardalen University, Sweden |
| 16.00 | *Applications of Object-oriented Bayesian Networks for Causal Analysis of Process Disturbances* <br> by Galia Weidl, Institute of Industrial Manufacturing and Management, University of Stuttgart, Germany, Anders.L.Madsen, Hugin Expert A/S, Denmark, Erik.Dahlquist, Mälardalen University, Sweden |

| 16.30 | *Modelling concurrent activities and resource sharing in Modellica* <br> by Håkan Lundvall, Peter Fritzson Dept. of Computer and Information Science, Linköping University |
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| 17.00 | *Developing simulation models for dynamic optimization* <br> by Petteri Pulkkinen, Heimo Ihalainen, Risto Ritala, Institute of Measurement and Information Technology, Tampere University of Technology |

## Session 2a: Non-process industry type of Applications, Chairman Ivica Crnkovic

| 13.30 | *Improved voltage sag ride-through for line-connected synchronous machines* <br> by Kai Pietilainen, Magnus Jansson and Lennart Harnefors, Electronics Dept., Mälardalen University, Sweden |
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| 14.00 | *Short term scheduling in electronics manufacturing using discrete event simulation* <br> by Sébastien Gebus, Alexandre Soulas and Esko Juuso, Control Engineering Laboratory, University of Oulu, Finland |
| 14.30 | *Discontinuous simulation techniques for worm drive mechanical system dynamics* <br> by Rostyslav Stolyarchuk, State Scientific and Research Institute of Information Infrastructure, National Academy of Sciences of Ukraine |

### 15.00- 15.30 Coffee break

| 15.30 | *SMIB- a pilot program system for stochastic simulation in insurance business* <br> by Dimitrii Silvestrov and Anatoliy Malyarenko, Dept. of Mathematics, Mälardalen University, Sweden |
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| 16.00 | *Generation of Random Atmosphere with Application to Statistical Flight Simulation* <br> by J. Roshanian , Dep of Mechanics, KNT University of Technology, Tehran, Iran |
| 16.30 | *Risk modelling ;definitions and methods of riskmodelling in relation to shipping in Lake Mälaren* <br> by Henrik Jacobson, Mälardalens University, Dept. of Public Technology , Sweden |

## 18.30 Dinner on a ship at Lake Mälaren

## Friday September 19, 2003

**Sessions 09.00 – 12.30**

**Coffe break 10.30- 11.00**

**Lunch 12.30- 13.30. (Meeting for the board of SIMS during the lunch)**

**13.30-15.00 Continuing sessions**

**Session 1b: Industrial Applications, Pulp and paper, Oil and gas, Waste water treatment and Metallurgical industry, Chairman: Jafar Mahmoudi**

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| 09.00 | *Framework for a control strategy of in-mill biological treatment using on-line sensors and dynamic modeling* <br> by Tomas Alexandersson, Christian Rosen and Ulf Jeppsson, Department of Industrial Electrical Engineering and Automation, Lund University, Sweden |
| 09.30 | *Copper Heat Sink Design* <br> Jafar Mahmoudi, Outokumpu, Vasteras, Sweden |
| 10.00 | *Modelling of gas-solid fluid dynamics and pyrolysis, in a biomass-fired municipal CFB boiler* <br> by Ulf Sand*, Jan Sandberg*, Rebei Bel Fdhila**, Department of Public Technology, Fluid Dynamics Research Group,* Mälardalen University, Västerås, Sweden, ** ABB Corporate Research |

### 10.30- 11.00 Coffee break

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| 11.00 | *A combined physical and statistical simulation model for Black liquor gasification* <br> by Erik Dahlquist, Mälardalen University, Dept. of Public Technology, Sweden |
| 11.30 | *Intelligent   dynamic simulation of batch cooking* <br> by Esko Juuso, Control Engineering Laboratory, University of Oulu , Finland |
| 12.00 | Light propagation in pulp and paper research <br> by Torbjørn Smørgrav, Heidi Brunborg, Torbjørn Smørgrav†, Richard Blake‡, Per Nygard§, Department of computer and information science, NTNU, IME, Norway |

### 12.30- 13.30 Lunch

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| 13.30 | *Gas Pipes with Gas Mixtures* <br> by Bernt Lie, Telemark University College, Porsgrunn, Norway |
| 14.00 | *Synthesis and optimization of a methanol process* <br> by Jeppe Grue, Aalborg Universitet, Institute of Energy Technology, Denmark |
| 14.30 | *Transient simulation of refrigerated sea water system* <br> by *J. A. Thorsteinsson, P. Jenssona, T. Condrab, P. Valdimarssona, [a]University of Iceland,Department of Mechanical and Industrial Engineering Reykjavik, Iceland, [b]Aalborg University, Institute of Energy Technology, Denmark |

**Session 2b: Applications in Energy   Engineering (9 st) Chairman: Rebei Bel Fhdila**

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| 09.00 | *Robustness of component models in energy system simulators* <br> by Brian Elmegaard, Department of Mechanical Engineering, Technical University of Denmark,   Lyngby, Denmark |
| 09.30 | *Evaluation of Prosim and IPSEPro, two heat and mass balance based simulation softwares* <br> by Daniel Häggståhl, Erik Dahlquist, Mälardalen University, Department of Public Technology, Process Optimization and Diagnostic Laboratory, Sweden |
| 10.00 | *Mechanical CAD with Multibody Dynamic Analysis Based on Modelica Simulation* |

| | by Vadim Engelson, Peter Bunus, Lucian Popescu, Peter Fritzson, PELAB, Linköping University |
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## 10.30 – 11.00 Coffe break

| 11.00 | *Simulation of volatile gas release from a small dry wood particle undergoing pyrolysis in a hot convective flow field* <br> by Ulf Sand\*, Jan Sandberg\*, Rebei Bel Fdhila\*\*, \*Department of Public Technology, Fluid Dynamics Research Group, Mälardalen University, Sweden |
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| 11.30 | *Modelling losses within combustion chamber of diesel engines* <br> by Mohammad Nikian and S. K. Arya, Mech. Eng., Univ. of Urmia, Urmia, Iran |
| 12.00 | *Non-Thermal plasma treatment of automotive exhaust gases* <br> by M. Rezaei, A. Taeb, N. Habibi, Department of Chemical Engineering, Iran, University Of Science and Technology, Tehran, Iran |

## 12.30 – 13.30 Lunch

| 13.30 | *Modelling and simulating retube boiler performance* <br> by Kim Sörensen Aalborg University, Institute of Energy Technology, Claus M. S. Karstensen, Aalborg Industries A/S, Thomas Condra, Aalborg University, Niels Houbak, Technical University of Denmark, MEK, Lyngby, Denmark. |
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| 14.00 | *Modelling simulation and optimization of boiler heating surfaces and evaporator circuits* <br> by Kim Sörensen, Aalborg University, Institute of Energy Technology and Aalborg Industries A/S, Thomas Condra, Aalborg University, Institute of Energy Technology, Niels Houbak, Technical University of Denmark, MEK, Lyngby, Denmark |
| 14.30 | *Exploiting dual conditions in economic dispatch of district heating systems* <br> by Erik Dotzauer, Fortum Heat, Stockholm, Sweden |

### 15.00 Conclusions and Closing remarks, Peter Fritzon and Erik Dahlquist

### Spare talks, no oral presentation at the conference :

| | *Study vapour compression refrigeration and compare the performance of working refrigerants* <br> by M. Naghashzagan, Dept. of Mech Eng, Univ. of Guilan, Rashat, Iran |
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| | *Studying of the capabilitiy of the cermet tools during turning of steels* <br> by Tareq A. Abu Shreehah, Department of Mechanical Engineering, Al-Balqa' Applied University, Tafila Applied University College, Jordan |

*In connection to the conference there will be a course on ANN September 15-17:*

**"Identification and Forecasting of Dynamical Systems by Neural Networks Principles Techniques, Applications"**

Monday 15 Sep 9 – 16 Mälardalen Univ, Västerås, room S3-902

Tuesday 16 Sept. 9 – 16 Mälardalen Univ, Västerås, room R1-218

Wednesday 17 Sep 9 – 15 Mälardalen Univ, Västerås, room S3-908

**Lecturer:** Dr. Hans Georg Zimmermann
　　　　　　Senior Principal Research Scientist, Siemens AG, Corporate Technology, Munich

**Course content**

1. Introduction to Neural Networks
2. Neural Algorithms: More than the Numerics of Gradient Computation
3. Feedforward Neural Networks: More than Function Approximation
4. Model Building: More than Learning from Data
5. Neuro - Fuzzy: More than Neuro & Fuzzy
6. Recurrent Neural Networks: More than Algorithms
7. Open Systems: More than a Superposition of Internal & External Dynamics
8. Error Correction Neural Networks: More than Autoregressive Modeling
9. Variance-Invariance Separation: More than Dimensionality Reduction
10. Unfolding in Space and Time: More than Unfolding in Time
11. Time in Time Series Analysis: More than Data Time
12. Stochastic Modeling: More than Deterministic Forecasting
13. Causal-Retro-Causal Networks: More than Causal Networks
14. Online Learning: More than Plasticity versus Stability
15. Large Networks: More than Increasing Dimensionality
16. Decision Support Systems: More than Forecasting
17. Multi-Agent Market Modeling: More than Econometrics