Programme

5th MATHMOD Vienna
February 7-10, 2006
Vienna University of Technology
5th MATHMOD Vienna

5th Vienna International Conference on Mathematical Modelling

February 7 – 10, 2006, Vienna University of Technology

The scope of the conference covers theoretic and applied aspects of various types of mathematical i.e. formal modelling for systems of dynamic nature (deterministic, stochastic, continuous, discrete or hybrid, etc.). The conference is also dealing with alternative modelling and computation methods (e.g. cellular automata) and modelling for / in scientific computing.

The topics to be discussed will include e.g.
- modelling theory
- processes and methods for model formulation, identification, development, reduction and validation
- automation of modelling and software aids for modelling
- computer modelling and modelling for / by simulation
- qualitative modelling including fuzzy and iterative approaches to modelling
- modular modelling and interdisciplinary modelling
- learning networks / uncertainties in modelling
- methodologies for model validation
- fitting mathematical models to real processes
- relationship between the modelling approach and problem solutions
- comparison of methods for modelling, model reduction and model validation
- effects of modelling errors on overall performance of an engineering system
- applications in the field of engineering systems and in natural sciences
- applications in other fields (e.g. environmental systems, biotechnology, etc.)
- case studies of comparisons for ideas or methods
- education in modelling
- modelling aspects in scientific computing

Sponsors / Co-Sponsors

Institute for Analysis and Scientific Computing at Vienna University of Technology
Vienna University of Technology
IMACS (International Association for Mathematics and Computers in Simulation)
IFAC (Int. Fed. for Automatic Control)
ASIM (German Simulation Society)
EUROSIM (Federation of European Simulation Societies)
ARGESIM (Working Group Simulation News TU Vienna)
ÖMG – Austrian Mathematical Society
OCG – Austrian Computer Society
VDI/VDE - GMA, GAMM

Organisation

Institute for Analysis and Scientific Computing at Vienna University of Technology
ARGESIM Vienna University of Technology
International Programme Committee

I. Troch (Austria, Chairperson)
F. Allgoewer (Germany)  K. Juslin (Finland)  P.C. Müller (Germany)
P. Bogaerts (Belgium)  R. Karba (Slovenia)  D. Murray-Smith (UK)
P. Borne (France)  D. Karnopp (USA)  C. Natale (Italy),
W. Borutzky (Germany)  N. Kheir (USA)  M. Papageorgiou (Greece)
P. Breedveld (Netherlands)  R. King (Germany)  J.V.R. Prasad (USA),
F. Breitenecker (Austria)  U. Konigorski (Germany)  P. Rapisarda (Netherlands)
F. Chernousko (Russia)  S. Kowalewski (Germany)  K. Schlacher (Austria),
S. Engell (Germany)  A. Kugi (Germany)  A. Sydow (Germany),
K.H. Fasol (Germany)  B. Lohmann (Germany)  S. Tzafestas (Greece),
G. Ferretti (Italy)  J. Lunze (Germany),  A. Urquia (Spain),
P.M. Frank (Germany)  J. McPhee (Canada)  J. van Impe (Belgium),
M. Günther (Germany)  D.P.F. Möller (Germany)  R. Vichnevetsky (USA)

Date  February 7 – 10, 2006
February 7, 2006 - Workshops and Tutorials, Welcome Party
February 8 - 10, 2006 – All Sessions

Conference Site
Vienna University of Technology,
Freihaus Building, green and yellow area, 2nd and 3rd floor,
Wiedner Hauptstrasse 8-10, 1040 Vienna, Austria

How to Reach
The Vienna University of Technology is located right in the centre of Vienna and can be reached by public transport (U1, U2, U4, Tram 62 and Tram 65). Please inquire at your hotel how to get to Karlsplatz (name of the station) and how to get and use tickets for public transport. We recommend public transport, but you also find a parking garage directly at the conference site (gateway at Operngasse).

Conference Chairs: F. Breitenecker, I. Troch; Vienna University of Technology
Programme Chair: I. Troch, Vienna University of Technology
National Organising Committee: F. Breitenecker, I. Troch; F. Judex, J. Kropf
Conference Staff: A. Breitenecker, K. Breitenecker, G. Höfinger, Th. Löscher, N. Popper
G. Zauner, J. Funovits, D. Leitner

Information
For more information, please, contact the website of the MATHMOD Conference Series www.mathmod.at or contact the conference chair:
Univ. Prof. Dr. Inge Troch
Vienna University of Technology, Wiedner Hauptstrasse 8-10, A-1040 Vienna
Phone: +43-1-58801-10116, -10117; Fax: -10199; Inge.Troch@tuwien.ac.at
Conference Office

Conference Site, located at 2nd floor, green area (see map on cover)
Phone: +43-1-58801-10116; FAX: +43-1-58801-10199

Opening hours:  
Tuesday, Feb. 7, 2006: 12 am – 7 pm  
Wednesday, Feb. 8, 2006:  8 am – 7 pm  
Thursday, Feb. 9, 2006: 8.30 am – 7 pm  
Friday, Feb. 10, 2006:  8.30 am – 3 pm

Internet Access – PC Facilities

ZID, Information Technology Services of TU Vienna, offers WLAN access to internet for the duration of the conference, and, if necessary, also LAN access with twisted pair cable. WLAN is available in the whole conference area, also in the lecture rooms. Access via cable is provided near the Conference Office, where a print server can also be used (use memory sticks for data transfer).

WLAN access is controlled by an authentication server. The settings are:

Network name (SSID): tunet (hidden, not found by standard WLAN availability check)  
Network authentication: open mode, no network keys (WEP, …)  
Data encryption: disabled  
IP Address: automatically (DHCP)  
Name service: DNS server automatically (also for LAN)

Access to Internet (for WLAN and LAN):  
Starting a web browser and addressing an arbitrary Internet address (URL); a window from the Information Technology Services of TU Vienna appears, asking for Username and Password;

login with Username: mm2006 Password: mm2006

Accommodation

For your convenience Austropa Interconvention, our official contractor, is arranging the reservation of rooms in several hotels near the university. The Conference Office is not able to handle any requests and/or problems concerning accommodation. Please contact directly Austropa Interconvention, Friedrichstrasse 7, 1010 Vienna, Austria (indicating MATHMOD); e-mail: austropa@interconvention.at, Tel.: +43 1 588 00-510, Fax: +43 1 588 00-520;

Conference Publications

Conference Proceedings will be published in two Proceedings Volumes (Series ARGESIM-Reports, ISBN 3-901608-30-3), available at the begin of the conference:

Volume 1: Printed Abstract Volume (one page abstracts of papers and posters)  
Volume 2: CD Volume with full papers

Volume 1, the printed Abstract Volume, contains one-page abstracts of seven invited papers, of 262 contributed papers, and of 22 posters.
Volume 2, the Full Papers' Volume, on CD ROM, consists of the full text versions of the invited papers and of all contributed papers (6 - 15 pages).

Both volumes of these Proceedings start with the manuscripts of the invited lectures, followed by contributed papers which were either contributed upon invitation of a session organizer or, which were selected for presentation after a reviewing process which was based on extended abstracts. All these contributions were collected and arranged in sessions according to their main thematic point. It is by no means easy to group the papers because many contributions address several different aspects in a balanced manner. Therefore, the arrangement chosen for this volume follows rather closely the one of the conference where also time limitations had to be observed.

Volume 1, the Abstract Volume contains as its last part the abstracts of the contributed posters, which were undergoing also a review procedure and which are on display during the whole conference and discussed during a special poster session with a Best Poster Award.

Volume 2, the CD Volume, is structured in session, as the Abstract Volume, but in a hierarchical way: a HTML - menu shows the sessions titles, which are linked to HTML – submenus, listing all contributions to a session, contributions numbered consecutively. This list links to the contributions, which are stored as PDF files and paginated hierarchically: title of session – contribution number in session – number of page in contribution. Additionally, an Authors’ Index (authors and co-authors) links into the session, where the contribution is placed.

**MATHMOD Memory Stick.** At MATHMOD 2006, first time a reprint service for authors is established. Each author gets a MATHMOD Memory Stick with a reprint of his contribution, with all necessary bibliographical details. Additionally, further useful information about MATHMOD, journals, etc. can be found on the memory stick.

**Post Conference Publications / Copyright Regulations**

Any paper submitted to MATHMOD 2006 is automatically considered for publication in the official post-conference publications. Here the following regulations should be taken into account. IMACS holds the copyright for post conference publication of papers. i.e. a special issue of the IMACS journal MCS (Mathematics and Computers in Simulation).

If such a paper is published in IMACS-MCS, its copyright will remain the property of IMACS (or of the respective publisher).

If the paper is not to be published in the special issue of IMACS-MCS,

1. it (or a suitably enlarged version of it) will be considered for publication in MCMDS, the journal for "Mathematical and Computer Simulation of Dynamical Systems (published by Taylor and Francis) or,

2. in a special issue of other scientific journals (e.g. JIRS, SAMS).

If the author is not notified within five months after the date of the meeting (July 10, 2006 at latest) that the paper will appear in IMACS-MCS or be considered for publication in any other journal mentioned above, the paper is released for publication elsewhere.

In this case, the publication must contain reference to the paper having been presented at the MATHMOD 2006 Conference.
Conference Programme

The Programme consists of the Scientific Programme with Invited Lectures, Regular Sessions, Organised Sessions, Poster Sessions, and Tutorials, and of the Social Programme with various events.

Social Programme

The Social Programme is intended to stimulate communication among the participants and to get insight into the Viennese hospitality. Not only the evening events, but also the events and facilities during the session are to bring people together: Coffee Breaks, Poster Session, Closing Session / Party and meeting at coffee breaks and at Café Simulation.

Regular Participants are invited to join the following events:
- Welcome Party, Café Schrödinger Tuesday, Feb. 7, 2006, 6.30 pm
- Reception at the City Hall Wednesday, Feb. 8, 2006, 8 pm
- Evening at the Zwölf-Apostelkeller Thursday, Feb. 9, 2006, 8 pm
- Closing Session, Café Simulation Friday, Feb. 10, 2006, 2 pm

Accompanying Persons are also invited to the Get-Together Party, the Reception at the City Hall, the Evening at the Zwölf-Apostelkeller, and the Closing Session.

Additionally, Guided Tours in Vienna are offered. These tours start Wednesday, February 8, at 2pm, Thursday, February 9, at 9.30 am, and Friday, February 10, at 9.30pm and last between two and three hours.

For Student Participants, there are limited places at all social events mentioned before. Please contact the registration desk.

MATHMOD Accessories

MATHMOD 2006 provides for each participant items of scientific, sportive, and ‘spiritual’ value, being all MATHMOD souvenirs.

The MATHMOD Memory Stick provides for each participant reprints of their contributions, information on MATHMOD 2006 Conference, TU Vienna, the MATHMOD Yo-Yo Simulation Challenge, and publications related to mathematical Modelling and Simulation.

The ‘real world’ MATHMOD Yo-Yo invites participants to train their skillfulness with this toy to win the competition at the Closing Session, and to get stimulated for preparing a solution to the MATHMOD Yo-Yo Simulation Challenge. The MATHMOD Conference Wine - Grüner Veltliner and Zweigelt from vintner Sauer, Weinviertel, Lower Austria - is a real souvenir, to be tasted at home with family and friends, to remember MATHMOD 2006 and to think over attending MATHMOD 2009.

We thank Scientific Computers Germany (Maple Distributor; WWW.SCIENTIFIC.DE) and ARGESIM (WWW.ARGESIM.ORG) for co-sponsoring the memory sticks.

Coffee Breaks

Coffee and soft drinks are served during the breaks (one in the morning, one in the afternoon) on the 2nd floor in the green and yellow area, free of charge for participants. Additionally typical Austrian cakes are offered.
Cafe Simulation
Café Simulation, a Viennese-type Café, especially established for MATHMOD 2006 near the conference office, is intended to be an area for relaxation and a meeting point. Pictures of the conference are presented on video display, WLAN Internet access is also available there. Real Espresso, refreshments and sweets, champagne and MATHMOD Conference Wine are available for donation, accounted in MMs (1 MM= 50 cent).

Conference Fees

<table>
<thead>
<tr>
<th>Category</th>
<th>Fee</th>
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<tbody>
<tr>
<td>Regular Fee</td>
<td>€ 360.-</td>
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<tr>
<td>Regular Reduced Fee (members of co-sponsoring societies)</td>
<td>€ 310.-</td>
</tr>
<tr>
<td>Students (restrictions in Social Programme, just CD Volume of Proceedings)</td>
<td>€ 70.-</td>
</tr>
<tr>
<td>Accompanying Persons</td>
<td>€ 90.-</td>
</tr>
</tbody>
</table>

Conference Fees include Proceedings, MATHMOD Memory stick, coffee etc. during breaks, participation in all social events (except guided tours through Vienna), and Conference Wine. Accompanying Persons are invited to all social events, additionally three guided tours are organised for them. Additional tickets to all social events as well as Conference Wine may be purchased at the Conference Office.

Scientific Program

The Scientific Program consists of Invited Lectures, Regular Sessions, Organised Sessions, Poster Sessions, and Tutorials. This is a final program, but changes might be unavoidable. They will be announced on the white board near the conference office.

Plenary Lectures / Invited Contributions

The Invited Lectures cover a broad area of mathematical modelling and simulation. Seven scientists from abroad and from TU Vienna give an overview about state-of-the-art and recent developments.

Wednesday, Feb. 8, Room: Nöbauer Hörsaal, 10.00 – 11.00:  
**Modeling and simulation of steam turbine processes: individual models for individual tasks;**  
G. Zimmer (Germany)

Wednesday, Feb. 8, Room: Nöbauer Hörsaal, 14.00 – 16.00:  
**Block-Based Physical Modeling;** R. Rabenstein (Germany)

Wednesday, Feb. 8, Room: Nöbauer Hörsaal, 16.20 – 17.00:  
**Fuzzy Models for Precision Measurements;** R. Vierl (Austria)

Thursday, Feb. 9, Room: Nöbauer Hörsaal, 09.00 – 10.00:  
**Mathematical Modeling for Nonlinear Control: a Hamiltonian Approach;** K. Schlacher (Austria)

Thursday, Feb. 9, Room: Nöbauer Hörsaal, 14.00 – 15.00:  
**Simulation in Robotics;** L. Zlajpah (Slovenia)
Contributed Papers – Regular Sessions and Organised Sessions

There are two types of contributed papers. The one are regularly contributed papers which have been selected upon recommendation by the IPC (at minimum three reviewers). The other ones are papers, which have been contributed upon invitation to a Special Session by a session organizer; there, review was established by the session organiser. The papers are declaimed in up to seven parallel sessions.

Presentation of papers
Twenty minutes are reserved for each contribution. Authors have 15 minutes to perform their ideas and results. Five minutes are reserved for discussion. A beamer and an overhead projector are available in every lecture hall. Authors are asked, to meet with the session chair before beginning of the session in the lecture halls, and to give him the Authors’ Introduction Sheet.

Poster Contributions
Poster contribution have been also reviewed by the IPC. They inform about recent and ongoing research and applications. Posters will be displayed during the whole conference, and additionally, there will be a poster session with reserved time for discussion of posters without any other session in parallel.
For posters, a one-page abstract is published in the Abstract Volume (Volume 1) of the Conference Proceedings.
The poster itself should have maximum size of 1 m (width) x 1.5 m (heights), at best portrait A0 format. The prepared poster should be on display during the whole conference in the poster area. Authors should mount their poster at latest on Wednesday morning, February 8, 2006, before opening (9 am). Posters are on display from Wednesday, Feb. 8 till Friday, Feb. 10.

Poster Session / Best Poster Award
The Poster Session takes place on Thursday, 4 pm – 5 pm, in the hall in green and yellow area, second floor. Posters (provided by authors) and poster abstracts (provided by conference administration) are on display at two combined poster walls. These two poster walls build up a little booth, where each poster author is invited to present and to discuss about his contributions during the Poster Session.
All conference participants are invited to walk around in the poster area and discuss with the poster authors about their contribution, and finally to vote for the best poster.
There will be an award for the poster. Participants vote for the best poster. The winners will be announced on Friday, February 10, in the 2nd Plenary Session.
During the Poster Session coffee and snacks are served, furthermore there is an opportunity to taste the MATHMOD Conference Wine.
Closing Session / Closing Party

The Closing Session / Closing Party is intended to be as well part of the Scientific Programme as part of the Social Programme. The session takes place on Friday, Feb. 10, 2006, 2pm – 3pm.

The programme is:
- Official Closing of MATHMOD 2006 with acknowledgements
- Last administrative affairs (Post-Conference Publications, Late Papers, Pictures)
- Presentation of MATHMOD Yo-Yo Simulation Challenge with opportunity to train with ‘real-world’ MATHMOD yo-yo play – best yo-yo player gets selection of Conference Wine – details following page.
- Coffee, Snack, and tasting of Conference Wine

Tutorials at MATHMOD

On Tuesday, February 7, 2006 the following Tutorials / Information Seminars are offered:

- **New Features / Development of Maple.**
  Tuesday, Feb 7, 2006, Seminar Room 101B, FH 3rd floor, 14.30 - 18.00
  Th. Richard, Scientific GmbH Aachen

- **Principles of Object-Oriented Modeling and Simulation with Modelica**
  Tuesday, Feb 7, 2006, Seminar Room 101A, FH 3rd floor, 14.30 - 18.00
  P. Fritzson & P. Bunus, Univ. Linköping / PELAB

Participation is free (not coupled with participation at MATHMOD), including coffee break. Participants may attend the MATHMOD Welcome Party at 19.00, Cafe Schrödinger, TU Vienna.

Book and Journal Exhibition

On the 2nd floor, green area, an exhibition of books and journals related to mathematical modelling and simulation is prepared. The following publishers will present their books and journals (preliminary list): Springer, Cambridge University Press, SIAM, Taylor and Francis. ARGESIM / ASIM. Furthermore, authors of books on mathematical modelling and simulation have sent sample copies for display.

Tools and Software Exhibition and Display

Developers and distributors present information and/or demonstrate software for modelling and simulation. *Scientific Computers* will present all around Maple in an own booth. *COMSOL* and *The Mathworks* have provided information on FEMLAB and MATLAB.

MATHMOD Yo-Yo Simulation Challenge

The MATHMOD Yo-Yo Simulation Challenge addresses as well physical skillness as well as knowledge in modelling and simulation. This contest was initiated at the 4th MATHMOD Conference in Vienna, 2003. Participants had the opportunity to train their skillfulness with a real yo-yo play, a promotion gift.

On occasion of MATHMOD 2006 Conference, participants again get a MATHMOD Yo-Yo for training physically, and the MATHMOD Yo-Yo Simulation Challenge is started officially.

During the Closing Session, participants have the opportunity to train and show their skillfulness with the yo-yo play, and may win selections of the MATHMOD Conference Wine.
Real world yo-yo players feel challenged by mastering tricks with their toy on different levels of difficulty.

The scientific idea of the MATHMOD Yo-Yo Simulation Challenge is similar: to create computational mathematical models of increasing complexity simulating the dynamic behaviour of a yo-yo. Only very few data are necessary to describe the parameters of the MATHMOD Yo-Yo. For more details see MATHMOD Yo-Yo Simulation Challenge Leaflet or visit the websites www.mathmod.org or www.argesim.org.

Not only participants of MATHMOD 2006, but also all simulationist, mechanical engineers, control engineers, etc. are invited to participate, to develop and implement a model of the dynamics of a yo-yo play with a modelling method, modelling software, and simulation software of their choice.

Solutions should be sent to sne@argesim.org, to be published in Simulation News Europe - SNE and / or at the ARGESIM website www.argesim.org (solutions will be reviewed).

At MATHMOD 2009 a Special Session will present approaches and solutions of this challenge.

About IMACS
IMACS is an International Association of professionals and scientists concerned with computers, computational and applied mathematics, in particular as they apply to the simulation of systems. This includes numerical analysis, mathematical modelling, approximation theory, computer hardware and software, programming languages and compilers. IMACS also concerns itself with the general philosophy of scientific computation and applied mathematics.

IMACS is one of the five International Scientific Associations (with IFAC, IFORS, IFIP and IMEKO) represented in FIACC, the five international organizations in the area of computers, automation, instrumentation and the relevant branches of applied mathematics. Of the five, IMACS is the oldest, having been founded in 1956.

About MATHMOD Conference Series
The conference series *Vienna International Conference on Mathematical Modelling* (MATHMOD Vienna) takes place every third year at Vienna University of Technology. The series started in 1994, followed by conferences in 1997, 2000, 2003 and in 2006, respectively.

At MATHMOD Vienna scientists and engineers using or developing models or interested in the development or application of various modelling tools are offered an opportunity to present ideas, methods and results and discuss their experiences or problems with experts of various areas of specialisation.

The scope of the MATHMOD conference series covers theoretic and applied aspects of various types of mathematical modelling. Comparison of modelling approaches, model simplification, modelling uncertainties, port-based modelling and the impact of items such as these on problem solution, numerical techniques, validation, automation of modelling and software support for modelling, co-simulation, etc are discussed.

The 5th MATHMOD – MATHMOD 2006, February 7-10, 2006 gathered some 300 scientists from 33 countries, showing a broad variety of the *art of mathematical modelling*. Theoretical investigations were only one aspect, various kind of applications, but also implementation and design of appropriate software based on formal or mathematical models were among the main topics discussed during the conference. For February 2009, the 6th MATHMOD Vienna is planned. More information at www.mathmod.at.
Final Scientific Program

Tutorial Sessions
Tuesday, Feb. 7, FH SEM 101A, 14.30 – 18.00
14.30 - 16.00 and 16.30 – 18.00
New features / Development of Maple
Th. Richard, Scientific GmbH Aachen

Tuesday, Feb. 7, FH SEM 101B, 14.30 – 18.00
14.30 - 16.00 and 16.30 – 18.00
Principles of Object-Oriented Modeling and Simulation with Modelica
P. Fritzson & P. Bunus, Univ. Linköpping / PELAB

Wednesday, Feb. 8, Nöbauer FH 08, 9.00 – 10.00
Opening Session
Welcome Adresses, Pictures of Vienna, Administrative Affairs
Music by “Weana Gmüat – Schrammeln”

Wednesday, Feb. 8, Nöbauer FH 08, 10.00 – 11.00
Plenary Lecture
Session Chair:  Inge Troch
10.00 Modeling And Simulation Of Steam Turbine Processes; Individual Models For
Individual Tasks
G. Zimmer (Mülheim, D)

Wednesday, Feb. 8, Nöbauer FH 08, 11.20 – 13.00
Modelling and Simulation in Systems Biology 1
Session Organizer:  Wolfgang Wiechert
Session Chair:   Aljoscha Wahl
11.20 Time Constants Of Metabolic Carbon Labeling Systems
K. Nöhl*, S. Adam, M. Weitzel, W. Wiechert (Siegen, D)
11.40 Chemical Reaction Network Theory – A Tool For Systems Biology
C. Conradi* (Magdeburg, D), J. Saez-Rodriguez, E.-D. Gilles, J. Raisch
12.00 Linear-Logarithmic Kinetics; A Framework For Modeling Kinetics Of Metabolic
Reaction Networks
I.E. Nikerel*, W.A. van Winden, W.M. van Gulik, J.J. Heijnen (Delft, NL)
12.20 Dynamic Analysis And Control Of Biochemical Reaction Networks
I. Otero-Muras*(Vigo, E), G. Szederkenyi (Budapest, HU), K.M Hangos (Budapest, HU), A. A. Alonso
(Vigo, E)

Wednesday, Feb. 8, FH HS 2, 11.20 – 13.00
Structural Control
Session Organizer:  Hans Irschik and Markus Gusenbauer
Session Chair:   Hans Irschik
11.20 Approximation Of Shape Functions With A Finite Number Of Actuators Using Tools
From Differential Geometry
T. Rittenschober*, M. Gusenbauer (Steyr, A)
11.40 Displacement Control Of Visco-Elastic Structures
H. Irschik*, M. Krommer (Linz, A)
12.00 Stabilisation Of A Frame Structure Controller Design, Implementation And
Experiments
J. Schröck*, K. Zehetleitner (Linz, A)
12.20 Mathematical Modeling, Control And Experimental Validation Of An Earthquake
Excited One-Story Frame
D. Huber*, H. Irschik, M. Krommer (Linz, A)
12.40 Compensation Of Flexural Vibrations In A Cantilever Using Distributed Piezoelectric Sensors And Actuators
M.Nader*, H. - G. v. Garssen, H. Irschik (Linz, A)

Wednesday, Feb. 8, FH HS 3, 11.20 – 13.00
**Modelling Methods and Techniques 1**
Session Chair: Francoise Couenne
11.20 Duality Of Linear Systems: A Bond Graph Perspective
S. Lichiardopol*, C. Sueur (Lille, F)

11.40 An Optimal Control Problem: Bond Graph Representation And Solver Implementation
B. Chereji*, O. Mouhib, W. Marquis-Favre, D. Thomasset, J. Pousin, M. Picq (Lyon, F)

12.00 Relationships Between Model Inversion And Inverse Simulation Techniques
Linghai Lu*, D.J. Murray-Smith, E.W. McGookin (Glasgow, UK)

12.20 Concepts For High Performance Generic Scientific Computing
R. Heinzl*, P. Schwaha, T. Grasser, M. Spevak (Vienna, A)

12.40 Modelling And Stability Analysis Of Linear Switched Systems Via Topologic Considerations Using Graph Theory
M.de la Sen, A. Ibeas* (Bilbao, E)

Wednesday, Feb. 8, FH HS 4, 11.20 – 13.00
**Multiscale Modelling in Materials Science**
Session Organizer / Session Chair: Martin Burger and Peter Weinberger
11.20 Multi-Scale Approaches In Computational Materials Science
P. Weinberger (Vienna, A) *

11.40 New Scales: Properties Of Nanostructures In The Femtosecond Regime
A. Vernes* P. Weinberger (Vienna, A)

12.00 Scientific Computing In Thin Film Growth
A. Voigt* (Bonn, D)

12.20 A Model Hierarchy For Surface Diffusion: The Small Slope Case
M. Burger* (Linz, A)

Wednesday, Feb. 8, FH HS 7, 11.20 – 13.00
**Stochastic Optimization Models 1**
Session Organizer / Session Chair: Kurt Marti
11.20 Endogenous Risks And Learning In Climate Change Decision Analysis
B.C. O'Neill, Y. Ermoliev, T. Ermolieva* (Laxenburg, A)

11.40 An Integrated Approach To Catastrophic Risks Management
G. Fischer*, T. Ermolieva, H.T. van Velthuizen (Laxenburg, A)

12.00 Discounting, Catastrophic Risks Management And Vulnerability Modeling
Y. Ermoliev*, T. Ermolieva, G. Fischer, S. Nilson, M. Obersteiner (Laxenburg, A)

12.20 Adoption Of New Technology: The Case Of Future Pulp And Paper Mills
Z. Chladná* (Laxenburg, A), M. Čhladný (Bratislava, SVK), K. Möllersten (Luleå, S), M. Obersteiner (Vienna, A)

Wednesday, Feb. 8, FH SEM101A, 11.20 – 13.00
**Discrete Modelling and Planning 1**
Session Chair: Bernard Henri Fleury
11.20 Parameter Estimation Of The Generalized Gamma Distribution
O. Gomes*, C. Combes,A. Dussauchoy (Lyon, F)

11.40 Simulation Service Providing Based On Web Service Technology With Standardized Devs Models
M. Gyimesi* (Vienna, A)

12.00 An Optimisation-Oriented Model Of Distributed Supply-Chain
M. Ghirardi*, G. Menga, N. Sacco (Turin, I)
Get-Together Party

What: MATHMOD conference unofficially starts with a Get-Together Party at Café Schrödinger, right at the ground floor of the Freihaus Building.

Where: Freihaus, ground floor, green area
When: Tuesday, February 7, 2006, 6.30 pm

How to get there: Café Schrödinger is located at ground floor of the Freihaus Building, and can be reached through an entrance in the yellow area.

Cocktail Reception at Rathaus

What: A Cocktail Reception at the City Hall of Vienna (Rathaus), welcomed by a representative of the Mayor of Vienna

Where: Rathaus Wien
Lichtenfelsgasse 2
1010 Vienna
When: Wednesday, February 8, 2006, 8pm

How to get there: Either some 20 minutes walk from the Freihaus Building or take the U 2 (purple) from Karlsplatz to Rathaus (3 stops), or take Tram 1 or D from Karlsplatz / Oper to Rathausplatz / Burgtheater (4 stops); use entrance Lichtenfelsgasse (on the south side of the building).

Evening at Zwölf-Apostelkeller

What: The Zwölf-Apostelkeller is a typical Viennese wine-cellar, serving regional wine and traditional Heurigen food.

Where: Zwölf-Apostelkeller
Sonnenfelsgasse 3
1010 Vienna
When: Thursday, February 9, 2006, 8pm

How to get there: Either a short walk (about 25 minutes) from Vienna University of Technology down Kärntnerstraße, Stephansplatz and Rotenturmstraße, turn right at Lugeck, or shorten your walk by taking a ride with the U1 (red) from Karlsplatz to Stephansplatz.
Poster Session

**What:** During the Poster Session, authors will provide information on their current work. You can cast your votes for the Best Poster Award. Coffee and snacks will be served, and we invite you to taste the Conference Wine.

**Where:** Freihaus Building, second floor  
**When:** Thursday, February 9, 2006, 4 pm to 5pm

Conference Wine

**What:** After deciding whether our white or red conference wine suites your taste, collect your bottle of conference wine (please do not forget your voucher!)

**Where:** Freihaus Building, second floor, green area  
**Conference Office**  
**When:** Friday, February 10, 2006, 9 am to 2 pm

Café Simulation

**What:** Meet with colleagues from all over the world, prepare your presentation, or relax in MATHMOD’s typical Viennese café, the Café Simulation, with WLAN access.

**Where:** Freihaus Building, second floor, green area  
**When:** During the entire conference

Closing Party and MATHMOD Yo-Yo Simulation Challenge

**What:** All things have to come to an end, and so does the MATHMOD on Friday. We invite you to partake in the closing ceremony, a Closing Party at the Café Simulation. The closing ceremony will include the presentation of the MATHMOD Yo-Yo Simulation Challenge and a physical yo-yo competition.

**Where:** Café Simulation, Freihaus Building, second floor, green area  
**When:** Friday, February 10, 2006, 2 pm to 3 pm
### Tuesday, February 7

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>14.30-16.00</td>
<td>TUT1/1</td>
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<tr>
<td>16.00-16.30</td>
<td>Coffee Break</td>
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<tr>
<td>16.30-18.00</td>
<td>TUT2/1</td>
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<tr>
<td>18.30-20.30</td>
<td>Welcome Party, Cafe Schrödinger TU Vienna</td>
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### Wednesday, February 8

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<tr>
<td>9.00-10.00</td>
<td>Opening With &quot;Weana Gmüat - Schrammeln&quot;</td>
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<tr>
<td>10.00-11.00</td>
<td>Plenary Lecture G. Zimmer (Nöbauer HS)</td>
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<td>11.10-12.20</td>
<td>Coffee Break</td>
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<tr>
<td>11.20-13.00</td>
<td>Nöbauer FH 08 Modelling and Simulation in Systems Biology 1</td>
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<tr>
<td>12.00-14.00</td>
<td>FH 02 Structural Control</td>
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<td>13.00-14.00</td>
<td>FH 03 Modelling Methods and Techniques 1</td>
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<tr>
<td>14.00-15.00</td>
<td>FH 04 Multiscale Modelling in Materials Science</td>
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<tr>
<td>15.00-16.00</td>
<td>FH 07 Stochastic Optimization Models</td>
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<tr>
<td>16.00-17.00</td>
<td>SEM 101A Discrete Modelling and Planning</td>
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<tr>
<td>17.00-19.00</td>
<td>SEM 101B Physical Modelling 1</td>
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<tr>
<td>18.00-19.30</td>
<td>Lunch</td>
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<tr>
<td>19.30-22.00</td>
<td>Plenary Lecture R. Rabenstein</td>
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<td>20.00-22.00</td>
<td>Reception at Rathaus</td>
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### Thursday, Feb. 9, 2006

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<th>Time</th>
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<tr>
<td>09.00-10.00</td>
<td>Plenary Lecture K. Schlacher (Nöbauer HS)</td>
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<td>10.00-11.00</td>
<td>Nöbauer FH 08 Model Reduction and Reduced Order Modelling 1</td>
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<tr>
<td>11.00-11.20</td>
<td>Coffee Break</td>
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<tr>
<td>11.20-13.00</td>
<td>FH 02 Electrical and Power Systems 1</td>
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<td>12.00-14.00</td>
<td>FH 03 Modelling Methods and Techniques 4</td>
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<tr>
<td>13.00-14.00</td>
<td>FH 04 Mechanical Systems 1</td>
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<td>14.00-15.00</td>
<td>FH 07 Modelling for and Control 1</td>
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<tr>
<td>15.00-16.00</td>
<td>SEM 101A Discrete Modelling and Planning</td>
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<tr>
<td>16.00-17.00</td>
<td>SEM 101B Physical Modelling 4</td>
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<td>17.00-19.00</td>
<td>Lunch</td>
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<td>19.30-22.00</td>
<td>Plenary Lecture L. Zlajpah (Nöbauer HS)</td>
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<td>20.00-22.00</td>
<td>Poster Session - Coffee Break</td>
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<tr>
<td>20.00-22.00</td>
<td>Evening at Zwölf-Apostel-Keller</td>
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### Friday, Feb. 10, 2006

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<tr>
<td>09.00-10.00</td>
<td>Plenary Lecture P. Schwarz (Nöbauer HS)</td>
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<td>10.00-11.00</td>
<td>Nöbauer FH 08 Mechanical Systems 3</td>
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<td>11.00-11.20</td>
<td>Coffee Break</td>
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<td>11.20-12.00</td>
<td>Plenary Lecture S. Tagesen (Nöbauer HS)</td>
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<td>12.00-14.00</td>
<td>FH 04 Tool Integration and Interchange Formats for Hybrid Systems</td>
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<td>13.00-14.00</td>
<td>FH 03 Mathematical Modelling of Semiconductor Devices</td>
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<td>14.00-15.00</td>
<td>FH 04 Process Modelling 2</td>
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<td>15.00-16.00</td>
<td>FH 07 Future Mobile Communication Systems</td>
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<tr>
<td>16.00-17.00</td>
<td>SEM 101A Mathematical Models of Co-operative Multiagent Systems</td>
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MATHMOD and Arts

The MATHMOD organisers try to design appealing conference badges, vouches and leaflets. For this reason it was decided to use paintings of famous Austrian artists. MATHMOD 2003 was dedicated to a well known family of painters, Kasimir, who painted at lot of Vienna’s buildings round the turn of the century. MATHMOD 2006 is dedicated to a world-famous Austrian Painter, one of the most prominent members of Vienna Art Nouveau (Vienna Secession) movement, Gustav Klimt. In his honour conference buttons were created with ten of his most famous paintings, nine of them can still be seen in Viennese Museums, the last was unfortunately destroyed at the end of World War II.

A mathematical model decides, which painting is assigned to a specific participant: a uniform distributed pseudo random number between 1 and 10, calculated by a linear-congruential pseudo random number generator, is assigned to the participant, indicating the number of the picture. Also vouchers for the Social Programme are decorated with paintings by Gustav Klimt.

Gustav Klimt
(July 14, 1862 - February 6, 1918)

Gustav Klimt was born in Baumgarten, near Vienna, Austria on the 14th of July 1862, the second of seven children. Father (Ernst Klimt) was an engraver and was married to Anna Klimt (nee Finster). He was educated at the Vienna Kunstgewerbe Art School in the years 1879-1883. Klimt was also an honorary member of the Universities of Munich and Vienna. His major works include paintings, murals, sketches and other art objects, many of which are on display in the Vienna Secession gallery. His work is distinguished by an elegant use of gold backgrounds and mosaic patterns. This can be seen in Judith I and in The Kiss.

Art historians note an eclectic range of influences contributing to Klimt's distinct style, including Egyptian, Minoan, Classical Greek, and Byzantine inspirations. Klimt was one of the founding members of the Wiener Sezession (Vienna Secession) and of the periodical Ver Sacrum. Klimt took annual summer holidays on the shores of Attersee and painted some of the landscapes he saw there. He died in Vienna the 6th of February 1918 and was interred at the Hietzing Cemetery, Vienna. Numerous painting were unfinished.
Ten Selected Paintings by Gustav Klimt

**Poppy Field, 1907**  
Oil on canvas, 110 x 110 cm  
Vienna, Österreichische Galerie, Belvedere

**Portrait of Adele Bloch-Bauer I, 1907**  
Oil and gold on canvas, 138 x 138 cm  
Vienna, Österreichische Galerie, Belvedere

**Avenue in Schloß Kammer Park, 1912**  
Oil on canvas, 110 x 110 cm  
Vienna, Österreichische Galerie, Belvedere

**Portrait of Adele Bloch-Bauer II, 1912**  
Oil on canvas, 190 x 120 cm  
Vienna, Österreichische Galerie, Belvedere

**Malcesine on Lake Garda, 1913**  
Oil on canvas, 110 x 110 cm  
Destroyed

**Apple Tree, 1912**  
Oil on canvas, 109 x 110 cm  
Vienna, Österreichische Galerie, Belvedere

**Judith I, 1901**  
Oil on canvas, 84 x 42 cm  
Vienna, Österreichische Galerie, Belvedere

**Portrait of Emilie Flöge, 1902**  
Oil on canvas, 181 x 84 cm  
Vienna, Kunsthistorisches Museum

**Arbor Vitae, 1905-109**  
Watercolors on wrapping paper, 175 x 100 cm  
Vienna, MAK- Museum für Angewandte Kunst

**The Kiss, 1907-8**  
Oil on canvas, 180 x 180 cm  
Vienna, Österreichische Galerie, Belvedere
Wednesday, Feb. 8, FH SEM101B, 11.20 – 13.00

**Physical Modelling 1**

Session Chair: Anton Arnold

11.20 Mathematical Model Of Dynamic Heat Transfer In A Human-Clothing-Environment System
Zhu Fanglong*, Zhang Weiyuan, L. Liying (Shanghai, China)

11.40 On The Numerical Solution Of The One-Dimensional Shallow Sea Waves
A. G. Bratsos* (Athens, GR), A. M. Prospathopoulos (Anavyssos, GR), Th. Famelis (Athens, GR)

12.00 Dynamic Modelling And Simulation Of A Three-Phase Gravity Separator
N. Al-Hatmi*, M. Tham (Newcastle upon Tyne, UK)

12.20 Simulation Of Hindered Diffusion In Spatially Structured Domains Using A Parallel Cellular Automaton
E. von Lieres*, M. Finke (Jülich, D), U. Buschmann (Siegen, D)

Wednesday, Feb. 8, Nöbauer FH 08, 14.00 – 15.00

**Plenary Lecture**

Session Chair: Felix Breitenecker

14.00 Block Based Physical Modelling
R. Rabenstein*, S. Petrausch (Erlangen, D)

Wednesday, Feb. 8, Nöbauer FH 08, 15.00 – 16.00

**Modelling and Simulation in Systems Biology 2**

Session Organizer: Wolfgang Wiechert
Session Chair: Aljoscha Wahl

15.00 Visualizing Regulatory Interdependencies And Parameter Sensitivities In Biochemical Network Models
S. Noack*, A. Wahl (Jülich, D), M. Haunschild (Siegen, D), E. Qeli (Marburg, D), B. Freisleben (Marburg, D), W. Wiechert (Siegen, D)

15.20 A Hybrid Optimisation Method For Parameter Estimation In Systems Biology
E. Balsa-Canto* (E), M. Peifer, J. Timmer (Freiburg, D), J.R. Banga (E), C. Fleck (Freiburg, D)

15.40 Control Of Travelling Waves In Reaction-Diffusion Biological Systems
C. Vilas*, M.R. Garcia, J.R. Banga, A.A. Alonso (Vigo, E)

Wednesday, Feb. 8, FH HS 2, 15.00 – 16.00

**Electrical and Power Systems 1**

Session Chair: Michael Fette

15.00 Noise Analysis Of Phase Locked Loops Using Stochastic Differential Equations
J. Anders, W. Mathis* (Hannover, D)

15.20 Modeling Of Electrical Multivibrators By Singularly Perturbed Systems
M. Prochaska*, F.A. Probst, K. Bohle, W. Mathis (Hannover, D)

15.40 A Network Approach To The Modelling Of Active Magnetic Bearings
C. Collon*, S. Eckhardt, J. Rudolph (Dresden, D)

Wednesday, Feb. 8, FH HS 3, 15.00 – 16.00

**Modelling Methods and Techniques 2**

Session Chair: David J. Murray-Smith

15.00 On Numerical Solution Of Arbitrary Symmetric Linear Systems By Approximate Orthogonalization
C. Popa* (Constanta, Romania)

15.20 Shapes And Algorithm For Determining Signals Maximising The Absolute Value Of Error
E. Layer, K. Tomczyk* (Krakow, PL)

15.40 Multistep Fractional-Rational Numerical Method For Stiff Dynamic Problems
R. Stolyarchuk* (Lviv, UKR)
Wednesday, Feb. 8, FH HS 7, 15.00 – 16.00

**Stochastic Optimization Models 2**

Session Organizer / Session Chair: Kurt Marti

15.00  Structured Modeling For Efficient Treatment Of Uncertainty In Complex Problems  
M. Makowski* (Laxenburg, A)

15.20  Multiple First Order Reliability Methods (Mform)  
K. Marti* (Munich, D)

15.40  Asymptotic Trajectory Matching In Self-Navigation Of Autonomous Manless Interceptors: A Nonsearch Method And A Formulation Of The Functional Optimization Of The Stability Of Random Systems  
E. Mamontov* (Gothenborg, S), A. Koptioug (Östersund, S), M. Mångård (Linköping, S), K. Marti (Munich, D)

Wednesday, Feb. 8, FH SEM101A, 15.00 – 16.00

**Discrete Modelling and Planning 2**

Session Chair: Jörg R. Müller

15.00  Optimal Production Planning In A Firm Subject To Environmental Constraints  
C. Z. Rădulescu*, M. Rădulescu, S. Rădulescu (Bucharest, RO)

15.20  Timed Petri Net Simulation In Matlab: A Production Cell Case Study  
T. Löscher* (Vienna, A), D. Gradišar (Ljubljana, SLO), F. Breitenecker (Vienna, A), G. Mušič (Ljubljana, SLO)

15.40  A Queue Model For The Operational Planning Of Maritime Container Terminals  
A. Alessandri, S. Sacone, S. Siri* (Genova, I)

Wednesday, Feb. 8, FH SEM101B, 15.00 – 16.00

**Physical Modelling 2**

Session Chair: Luigi del Re

15.00  A Lattice Boltzmann Model For Pulsative Blood Flow In Elastic Vessels  
D. Leitner*, S. Wassertheurer, F. Breitenecker (Vienna, A)

15.20  A Model For Heap Bioleaching Of Chalcocite With Heat Balance: Effect Of Gas Flow Rate  
M. J. Leahy*, M. R. Davidson, P. Schwarz (Clayton, Australia)

15.40  Shapes Optimization In Viscous Incompressible Flows By Solution Of The Inverse Problem  
N.B. Fedosenko* (St. Petersburg, Russia)

Wednesday, Feb. 8, FH Nöbauer FH 08, 16.20 – 17.00

**Plenary Lecture**

Session Chair: Felix Breitenecker

16.20  Fuzzy Models For Precision Measurements  
R. Viertel* (Vienna, A)

Wednesday, Feb. 8, FH Nöbauer FH 08, 17.00 – 19.00

**Modelling of Distributed-parameter Systems for Control Purposes**

Session Organizer / Session Chair: Andreas Kugi

17.00  Model Inversion For Distributed–Parameter Systems Using Summability Methods  
T. Meurer* (Saarbrücken, D), M. Zeitz (Stuttgart, D)

17.40  Hybrid Modeling Of A Stratified Storage Tank  
T. Kreuzinger*, M. Bitzer (Schwieberdingen, D), W. Marquardt (Aachen, D)

18.00  Modeling Of Piezoelectric Structures -A Hamiltonian Approach  
H. Ennsbrüner*, K. Schlacher (Linz, A)

18.20  Front End Bending Caused By Asymmetrical Rolling Conditions: An Analytical Approach  
T. Kiefer*, A. Kugi (Saarbrücken, D)
Wednesday, Feb. 8, FH HS 2, 17.00 – 19.00

**Advanced Mathematical Methods for Simulation Based Research Services**
Session Organizer / Session Chair: Kaj Juslin

17.00  Comparison Of Pid, Imc And Fuzzy Gain Scheduling Controllers In Varying Time-Delay Systems
       L. Eriksson*, H. N. Koivo (Finland)

17.20  Self-Tuning Recursive Modelling And Estimation Of Weather Measurements
       V. Hasu*, J. Poutiainen, H. Koivo (Helsinki, FIN)

17.40  Concurrent Engineering Of Subprocess Models With Apros
       T. Ollikainen*, K. Porkholm (Finland), A. Ahmed (Egypt)

18.00  System Dynamics – A Tool For Designing And Analysing Complex Processes
       J.P. Ylén*, V. Höltä (Finland)

18.20  Solving Matrix Equations In LargeScale Dynamic Simulation Of Flow Networks
       A. Villberg*, T. Karhela (Finland)

Wednesday, Feb. 8, FH HS 3, 17.00 – 19.00

**Modelling Methods and Techniques 3**
Session Chair: Ulrich Konigorski

17.00  Investigation Of Structure Of Dynamic Process Models Via Simplified Representation Graphs
       A. Leitold*, M. Gerzson (Veszprém, H)

17.20  Cognitive Modeling To Realize Autonomous Behavior In Mobile Robotics
       E. Ahle*, D. Söffker (Duisburg, D)

17.40  Cognitive Approaches Realizing Flexible Interaction Behavior Of Cognitive Technical Systems: A Comparison
       D. Söffker* (Duisburg, D)

18.00  A User-Interface For Exploring Large Graphs
       S. Wiegreffe* (Hamburg, Germany)

18.20  Implementation Of Gaussian Process Models For Nonlinear System Identification
       K. Thompson*, D.J. Murray-Smith (Glasgow, UK)

18.40  Improving The Local Modelling Of The Chaotic Time Series
       M. Ataei* (Isfahan, Iran)

Wednesday, Feb. 8, FH HS 4, 17.00 – 19.00

**Efficient Operation of Sequential Batch Reactors for Wastewater Treatment**
Session Organizer / Session Chair: Denis Dochain

17.00  Experiments For Modelling The Biodegradation Of Wastewater In Sequencing Batch Reactors
       G. Buitrón (Mexico City, Mexico), R. Canziani* (Milano, I), M. Torrijos (Narbonne, F), S. Gutiérrez (Montevideo, Uruguay), I. Moreno-Andrade (Mexico City, Mexico), D. Mazouni (Narbonne, F), N. Fiocchi, E. Ficara (Milano, I), G. Moreno (Mexico City, Mexico), A. Benitez (Montevideo, Uruguay), J. Pérez (Mexico City, Mexico), A. Ferrari (Montevideo, Uruguay)

17.20  Dynamical Modelling, Identification And Software Sensors For SBRs
       H. Fribianto (Louvain-la-Neuve, Belgium), D. Mazouni (Narbonne, F), M. Ignatova (Sofia, Bulgaria), M. Herveau (Narbonne, F), J. Harmand (Narbonne, F), D. Dochain* (Louvain-la-Neuve, Belgium)

17.40  Development Of Hardware Sensors For The On-Line Monitoring Of SBR Used For The Treatment Of Industrial Wastewaters

18.00  Optimal Control Of Biological SBRs For The Treatment Of Dairy And Toxic Wastewaters
       M. J. Betancur (Mexico City, Mexico), D. Mazouni, J. Harmand* (Narbonne, F), J. A. Moreno (Mexico City, Mexico)

18.20  Detection Of Abnormal Conditions Of An Aerobic SBR Process Using Feature Extraction
       D. Wimberger*, C. Verde Rodarte (Mexico City, Mexico)
18.40 Development Of An Integrated System For The Optimisation Of SBRs
P. Ratini* M. Pirani, S. Mariani, A. Quintabà, L. Luccarini, D. Mazouni, N. Fiocchi, J. Harmand

Wednesday, Feb. 8, FH HS 7, 17.00 – 19.00

Object Oriented Modelling in Mechatronics
Session Organizer / Session Chair: Gianni Ferretti and Francesco Casella

17.00 Object-Oriented Modelling Of Two-Phase Fluid Flows By The Finite Volume Method
F. Casella* (Milano, I)

17.20 Modelling And Simulation Of Motorcycle Dynamics For Active Control System Prototyping
G. Ferretti*, S.M. Savaresi, F. Schiavo, M. Tanelli (Milano, I)

17.40 Object Oriented Modelling And Simulation Of Parabolic Trough Collectors With Modelica
L. J. Yebra*, M. Berenguel, E. Zarza, S. Dormido (Almería, E)

18.00 Modelling, Simulation And Control Of Spacecraft With Flexible Appendages
F. Schiavo*, M. Lovera (Milano, Italy)

18.20 Automating The Selection Of Numerical Solvers
P. Bunus* (Linköping, S)

Wednesday, Feb. 8, FH SEM101A, 17.00 – 19.00

Issues of Model Quality and Validation
Session Organizer / Session Chair: David J. Murray-Smith

17.00 Simulation Model Quality Issues In Engineering: A Review
D.J. Murray-Smith* (Glasgow, UK)

17.20 Simulation Model Development In Analogy With Software Engineering
M. Valasek* (Prague, CZ)

17.40 Gaussian Process Models Validation: Biotechnological Systems Case Studies
K. Ažman*, J. Kocijan (Ljubljana, Slovenia)

18.00 Comparative Evaluation Of Nonlinear Identification Approaches
C. Märzinger, L. del Re*, E. Grünbacher, A. Schrempf, (Linz, A)

18.20 Fault Detection Based On Gaussian Process Models
D. Juričič* (Ljubljana, SLO), J. Kocijan (Nova Gorica, SLO)

18.40 Knowledge Support Of Simulation Model Development By Reuse
M. Valasek*, P. Steinbauer, Z. Sika (Prague, CZ), Z. Zdrahal, P. Mulholland (Milton Keynes, UK)

Wednesday, Feb. 8, FH SEM101B, 17.00 – 19.00

Physical Modelling 3
Session Chair: Jan G. Korvink

17.00 Modeling Of A Two-Axis Gimbal Test-Bed For Line-Of-Sight Stabilization
K. Fadaei, M. Ataei*, S. Talebi (Kerman, Iran)

17.20 Optimal Control Of Quantum Systems Under Non-Markovian Constraints
W. Pötz*, A. Goritschnig, H. Jirari (Graz, A)

17.40 Airflow-Dependent Models For Virtual Sensing Of Thermal Comfort
F. Felgner*, L. Litz (Kaiserslautern, D)

18.00 Education In Modelling And Simulation Using Argesim Comparisons/Benchmarks With Physical Modelling
F. Judex*, F. Breitenecker, N. Popper (Vienna, A)

18.20 Patterns Storage And Recall In Quantum Associative Memories
G.G. Rigatos* (Patras, GR), S.G. Tzafestas (Athens, GR)

18.40 Monte Carlo Method For Modeling Of Electron Transport In Quantum Wires
T. Gurov, E. Atanassov (Sofia, BG), N. Nedjalkov, V. Palankovski* (Vienna, A)
Thursday, Feb. 9, FH Nöbauer FH 08, 9.00-10.00

**Plenary Lecture**

Session Chair: Inge Troch

9.00 Mathematical Modelling For Nonlinear Control - A Hamiltonian Approach  
K. Schlacher (Linz, A)

Thursday, Feb. 9, FH Nöbauer FH 08, 10.00-11.00

**Model Reduction and Reduced Order Modelling 1**

Session Organizer: Boris Lohmann and P. C. Müller  
Session Chair: Boris Lohmann

10.00 Parameter Preserving Model Reduction For Mems System-Level Simulation And Design  
E. B. Rudnyi*, C. Moosmann, A. Greiner, T. Bechtold, J. G. Korvink (Freiburg, D)

10.40 Multi-Parameter Polynomial Model Reduction Of Linear Finite Element Equation Systems  
O. Farle*, V. Hill, P. Ingelström, R. Dyczij-Edlinger (Saarbrücken, D)

Thursday, Feb. 9, FH HS 2, 10.00-11.00

**Electrical and Power Systems 2**

Session Chair: Wolfgang Mathis

10.00 Elimination Of Hopf Bifurcations Within A Powersystem Using Washout Filter  
I. Winzenick (Hamburg, D), M. Fette* (Paderborn, D), J. Hor (Hamburg, D)

10.20 Simulation Of Power Oscillations And Pressure Pulsations In A Hydraulic System Induced By Cavitating Vortex Rope  
J. Koutnik* (Heidenheim, D)

10.40 The Modelling Of The Ghazi-Barotha Hydro-Powerplant For The Purpose Of The Training Simulator  
S. Blažič*, D. Matko, M. Letonje, M. Clemente, I. Škrjanc (Ljubljana, SLO)

Thursday, Feb. 9, FH HS 3, 10.00-11.00

**Modelling Methods and Techniques 4**

Session Chair: Dirk Söffker

10.00 Identification And Approximation Of Rational And Non-Rational Linear Continous Time Systems  
U. Konigorski* (Darmstadt, D)

10.20 Linear Regressive Model Structures For Estimation And Prediction Of Compartmental Diffusive Systems  
D. Vries*, K. J. Keesman (Wageningen, DK), H. Zwart (Twente, DK)

10.40 An Approximate Normal Form Approach To Sampled Representations Of Nonlinear Systems  
J. Deutscher* (Erlangen, D)

Thursday, Feb. 9, FH HS 4, 10.00-11.00

**Mechanical Systems 1**

Session Chair: Friedrich Pfeiffer

10.00 Modelling The Air Path System Of Diesel Engines By Quasi-Lpv Identification Techniques  
Xiukun Wei*, L. Del Re (Linz, A)

10.20 Modelling Of The Air-System Of A Two-Stage Turbocharged Passenger Car Diesel Engine  
D. Schwarzmann*, R. Nitsche (Schwieberdingen, D), J. Lunze (Bochum, D)

10.40 A Linear Parametric Model Of An Air-Conditioning Unit With Operating Point Dependent Parameters Under Nearly Steady Weather Conditions  
R. Tawegoum* (Angers, F), B. Lecointre (Mulhouse, F)
Thursday, Feb. 9, FH HS 7, 10.00-11.00

**Modelling for/and Control 1**

Session Chair: Matthias Gerds

10.00 On State Space Realization Of Bilinear Input-Output Differential Equations
   Ü. Kotta*, T. Mullari (Tallinn, EST), A. S. Zinober (Sheffield, UK), P. Kotta (Tallinn, EST)

10.20 Climate Control Of A Bulk Storage Room For Foodstuffs
   S. van Mourik*, H. Zwart (Twente, NL), K. J. Keesman (Wageningen, NL)

10.40 A Fast Algorithm For Time Optimal Control Of A Cooperative Multi Manipulator System On Specified Path
   M.J. Sadigh*, M.H. Ghasemi (Isfahan, Iran)

Thursday, Feb. 9, FH SEM101A, 10.00-11.00

**Discrete Modelling and Planning 3**

Session Chair: Andreas Javor

10.00 Aspects Of Simulation For Planning Railway Operation
   A. Schöbel* (Vienna, A)

10.20 M/Gx/1 Queuing System For The Modeling Of Real-Time Services Over Ip Network
   N. Kryvinska* (Vienna, A)

10.40 An Internet Traffic Modelling/Performance Measuring Tool
   J. B. Lewoe*, A. Izworski, S. Skowronski (Wroclaw, PL)

Thursday, Feb. 9, FH SEM101B, 10.00-11.00

**Physical Modelling 4**

Session Chair: Herman Bruyninckx

10.00 Identification Of Transport Parameters For Gallium Nitride Based Semiconductor Devices
   A. Marchlewski, V. Palankovski*, E. Ungersböck, S. Selberherr (Vienna, A)

10.20 Multi-Scale Bond Graph Model Of The Electrochemical Dynamics In A Fuel Cell
   A. A. Franco*, P. Schott (Grenoble, F), C. Jallut, B. M. Maschke (Lyon, F)

10.40 On Some Convergence Results And Their Relation To The Impact Of Impurities On Effective Heat Conduction Properties
   L. Flodén, A. Holmbom*, M. Olsson, J. Silfver (Östersund, S)

Thursday, Feb. 9, FH Nöbauer FH 08, 11.20 – 13.00

**Model Reduction and Reduced Order Modelling 2**

Session Organizer: Boris Lohmann and P.C. Müller

Session Chair: Boris Lohmann

11.20 Controller Reduction: An Observer Based Approach
   A. Yousefi*, B. Lohmann (Munich, D)

11.40 Balanced Truncation Model Reduction Of Second-Order Systems
   T. Stykel* (Berlin, D)

12.00 Passive Reduced Order Modelling Of Second Order Systems By Back Conversion
   B. Salimbahrami*, B. Lohmann (München, D), A. Bunse-Gerstner (Bremen, D)

12.20 Order Reduction Of First And Second Order Systems Using Laguerre Series And Moment Matching
   R. Eid*, B. Salimbahrami, B. Lohmann (Munich, D)

12.40 A Special Method For Controller Reduction
   A. Hofer* (Graz, A)

Thursday, Feb. 9, FH HS 2, 11.20 – 13.00

**Nonlinear Oscillations**

Session Organizer: Horst Ecker and Alois Steindl

Session Chair: Horst Ecker

11.20 Torus Breakdown And Chaos In A System Of Coupled Oscillators
   T. Bakri* (Utrecht, NE)
11.40 Strange Beating Behaviour Of A Dry Friction Oscillator  
G. Cernák*, G. Stépan (Budapest, HU)

12.00 Hydraulic Switching Control With Nonlinear Converters  
R. Scheidl, B. Manhartsgruber*, H. Kogler (Linz, A)

12.20 Numerical Continuation Of Fixed Points Of Maps In Cl_Matcont  
H. Meijer* (Utrecht, NE)

Thursday, Feb. 9, FH HS 3, 11.20 – 13.00

Modelling in Biology and Physiology 1
Session Chair: Robyn Michelle Javier

11.20 Modelling Nectar-Collecting Behaviour In A Honeybee Colony  
R. Thenius*, T. Schmickl, K. Crailsheim (Graz, A)

11.40 Modelling The Self-Organized Division Of Labour In Honeybees  
T. Schmickl*, K. Crailsheim (Graz, A)

12.00 Growth Model For Mycorrhizal Funghi  
A. Schnepf* (Vienna, A), T. Roose (Oxford, UK)

12.20 Time Delay Model Of Algal Population Growth In A Photobioreactor  
J. Fišer*, J. Červený, P. Zítek (Prague, CZ)

Thursday, Feb. 9, FH HS 4, 11.20 – 13.00

Mathematical Modelling and Control of Chemical and Bio-chemical Processes
Session Organizer / Session Chair: Philippe Bogaerts and Jan van Impe

11.20 Design Of Estimators For Specific Growth Rate Control In A Fed-Batch E. Coli Fermentation  
I. Rocha*, A. C. A. Veloso, E. C. Ferreira (Braga, Portugal)

11.40 From Optimal To Practically Feasible Temperature Control Of A Tubular Reactor  
F. Logist*, I.Y. Smets, J.F. Van Impe (Leuven, Belgium)

12.00 Modelling The Response Of The Marine Micro Algae Emiliania Huxleyi To An Elevation Of pCO2  
O. Bernard*, S. Madani, A. Sciandra (Sophia-Antipolis, F)

12.20 Mechanistic Kla Modelling In An Upflowanaerobic Digestor  
J. Hess, O. Bernard* (Sophia-Antipolis, F)

12.40 Metabolic Flux Analysis : An Approach For Solving Non-Stationary Under-Determined Systems  
A. Provost*, G. Bastin (Louvain-la-Neuve, Belgium)

Thursday, Feb. 9, FH SEM101A, 11.20 – 13.00

PDAE Models in Engineering Applications
Session Organizer / Session Chair: Bernd Simeon

11.20 Modeling With Partial Differential-Algebraic Systems In Chip-Design  
A. Bartel*, R. Pulch (Wuppertal, D)

12.00 Modeling And Simulation Of Shape Memory Behavior  
G. Teichelmann*, B. Simeon (Munich, D), D. Helm (Kassel, D)

12.20 Data Evaluation As Source For Modelling In Nano-Imaging  
B. Alles* (Munich, D), E. Cotte (Dresden, D), B. Simeon (Munich, D)

Thursday, Feb. 9, FH SEM101B, 11.20 – 13.00

Modelling and Simulation for Control System Design, Coordination and Supervision 1
Session Organizer / Session Chair: Borut Zupančič

11.20 Design And Evaluation Of Control Algorithms For Nitrogen Removal In Activated Sludge Plant: A Simulation Study  
A. Stare*, N. Hvala, D. Vrečko, S. Strmčnik (Ljubljana, Slovenia)

11.40 Modelling Of Hydraulic Elements For Design And Supervision Of Hydraulic Processes  
M. Golob, B. Bratina*, B. Tovornik (Maribor, Slovenia)
12.00 Simulation Environment For Real Time Verification Of Control Algorithm
S. Alexik, M. Alexik* (Zilina, SVK)

12.20 Computer And Physical Simulations Combined To Support The Development Of A New Aircraft Fuel Management System
J. M. Giron-Sierra*, M. Seminario, J.F. Jimenez, C. Insaurralde (Madrid, E)

12.40 Modelling And Identification Of A Laboratory Helicopter
G. Karer*, B. Zupančič (Ljubljana, Slovenia)

Thursday, Feb. 9, FH SEM101B, 11.20 – 13.00

**Rule Based Automation of Engineering in Process Industries**
Session Organizer: Reiner Jorewitz and Ulrich Epple
Session Chair: Reiner Jorewitz

11.20 On Rule Based Automation Of Automation
S. Schmitz*, U. Epple (Aachen, D)

11.40 Rule Based Engineering Of Asset Management System Functionality
T. Schmidberger*, A. Horch, A. Fay, R. Drath (Hamburg, D)

12.00 A Rule Ontology As A Basis For Automatic Reasoning On Industrial Plant Information
T. Schmidberger*, R. Drath, A. Fay (Hamburg, D)

12.20 Automated Treatment Of Balances
R. Jorewitz*, A. Männemann, U. Epple, R. Böckler, W. Wille, R. Schmitz (Aachen, D)

Thursday, Feb. 9, FH Nöbauer FH 08, 14.00 – 15.00

**Plenary Lecture**
Session Chair: Felix Breitenecker

14.00 Simulation In Robotics
L. Zlajpah* (Ljubljana, Slovenia)

Thursday, Feb. 9, FH HS 2, 15.00 – 16.00

**Electrical and Power Systems 3**
Session Chair: Helmut Ennsbrunner

15.00 Computer Modeling And Simulation Of Electrical Power Systems
G. Fusco, M. Russo (Cassino, I), presented by F. Arrichiello

15.20 A Numerical Simulation Of The Dynamic Behaviour Of A Directly Wood Particle Fired Gas Turbine
F. Wingelhofer*, B. Glöckl (Vienna, A)

Thursday, Feb. 9, FH HS 3, 15.00 – 16.00

**Modelling in Biology and Physiology 2**
Session Chair: Richard Karba

15.00 Object Oriented Modelling Of Metabolic Pathways
A. Belič*, R. Karba, K. Fon-Tacer, T. Režen, D. Rozman (Ljubljana, SLO)

15.20 The Total Quasi-Steady State Approximation For Complex Enzyme Reactions
M. G. Pedersen (Lyngby, DK), A.M. Bersani*, E. Bersani (Rome, I), G. Cortese (Padova, I)

15.40 Modeling The Dynamics Of Biocontrol Systems Mechanistically
R.M. Javier*, J.J. DiStefano (Los Angeles, USA)

Thursday, Feb. 9, FH HS 4, 15.00 – 16.00

**Mechanical Systems 2**
Session Chair: Christina Verde

15.00 Mathematical Modeling Of Dynamic Processes Of Bucket Wheel Excavators
S. Bosnjak, Z. Petkovic, N. Zmuc*, S. Petric (Belgrade, Serbia)

15.20 Modeling And Analysis Of Machine Tools And Converting Machines
E. Schäfers* (Erlangen, D)

15.40 Modeling And Simulation In Continuous Casting
C. Furtmueller*, L. del Re, K. Moerwald (Linz, A)
Thursday, Feb. 9, FH HS 7, 15.00 – 16.00
**Modelling for/and Control 2**
Session Chair: Hans Josef Pesch

15.00 Modeling, Validation And Optimal Control Of Constrained Nonlinear Oil Tanker Motion
Tayfun Çimen* (Istanbul, TUR)

15.20 Modeling And Control Of An Elastic Ship-Mounted Crane Using Variable Gain Model-Based Controller
Y. Al-Sweiti*, D. Söffker (Duisburg, D)

15.40 Underground Analysis, Prognosis And Control, Based On Modern Ict Methods
D. P. F. Möller*, Ch. Körber, Ch. Zemke (Hamburg, D)

Thursday, Feb. 9, FH Green Area, 2nd Floor, Hall, 16.00 – 17.00
**Poster Session**
Session Chair: Inge Troch and Felix Breitenecker

Presentation of Posters
Voting for Best Poster Award

Thursday, Feb. 9, FH Nöbauer FH 08, 17.00 – 19.00
**Port-based Modelling and Control**
Session Organizer / Session Chair: Peter Breedveld

17.00 The Port-Hamiltonian Systems Approach To Modelling And Control Of Complex Dynamical Systems. Why Should You Ever Be Interested?
H. Bruyninckx* (Leuven, Belgium)

17.20 Port-Based Modeling Of Dynamic Systems In Terms Of Bond Graphs
P.C. Breedveld* (Enschede, NL)

17.40 Energy-Based Modelling And Control Of A Multi-Domain Energy Storage And Management System
C. Batlle*, A. D’oria, E. Fossas (Vilanova i la Geltrú, E), R. Ortega (F)

18.00 A Port Based Formulation Of Transport Phenomena

18.20 Control Of Port Hamiltonian Systems By Interconnection And Energy Shaping Via Generation Of Casimir Functions. An Overview
A. Macchelli* (Bologna, I), R. Pasumarthy (Twente, NL), A. J. van der Schaft (Groningen, NL)

18.40 Simple Elastic Systems, An Introduction Based On Geometry
K. Schlacher*, M. Schöberl, H. Ennsbrunner (Linz, A)

Thursday, Feb. 9, FH HS 2, 17.00 – 19.00
**Modelling and Simulation in the Pulp and Paper Industry**
Session Organizer / Session Chair: Bernt Lie

17.00 Use Of Modelling And Simulation In The Pulp And Paper Industry
A. Blanco (Madrid, E), E. Dahlquist (Vasteras, S), J. Kappen* (Munich, D), J. Manninen (Espoo, FIN), C. Negro (Madrid, E), R. Ritala (Tampere, FIN)

17.20 Use Of Mathematical Models And Simulators For On-Line Applications In Pulp And Paper Industry
A. Avelin*, J. Jansson, E. Dahlquist (Vasteras, S)

17.40 Optimal Pin Fin Heat Exchanger Surface For Pulp And Paper Industry
H. Nabati*, J. Mahmoudi (Västerås, S)

18.00 Modelling Of Uncertainty: Case Studies On Operation Of Papermaking Process
H. Jokinen, K. Latva-Käyrä, P. Pulkkinen, R. Ritala* (Tampere, FIN)

18.20 Application Of Advanced Data Treatment To Predict Paper Properties
A. Alonso*, A. Blanco, C. Negro, J. Tijero (Madrid, E)

18.40 Model Uncertainty And Control Consequences: A Paper Machine Study
B. Lie* (Porsgrunn, N)
### Thursday, Feb. 9, FH HS 3, 17.00 – 19.00
#### Petrinets: Current Research Topics and their Application in Traffic Safety and Automation Engineering
*Session Organizer / Session Chair: Eckehard Schnieder and Jörg Müller*

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<td>17.00</td>
<td>Petrinets As A Concept For Modeling Transport Automation Systems</td>
<td>E. Schnieder, J. R. Müller* (Braunschweig, D)</td>
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<td>17.20</td>
<td>A Petri Net Approach To Debug Simulation Models Of Logistic Networks</td>
<td>P. Kemper*, C. Tepper (Dortmund, D)</td>
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<td>17.40</td>
<td>Construction And Correctness Analysis Of A Model Transformation From Activity Diagrams To Petri Nets</td>
<td>H. Ehrig, K. Ehrig, C. Ermel*, J. Padberg (Berlin, D)</td>
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<td>18.00</td>
<td>Integration Of Planning And Production Processes</td>
<td>C. Simon* (Koblenz, D)</td>
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<td>18.20</td>
<td>The Concept Of Duality In Petrinets And It’S Impact For Reliability Engineering</td>
<td>J. R. Müller*, E. Schnieder (Braunschweig, D)</td>
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### Thursday, Feb. 9, FH HS 4, 17.00 – 19.00
#### Modelling of Enviromental Systems
*Session Organizer: Albrecht Gnauck and Bernhard Luther*
*Session Chair: Bernhard Luther*

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<td>17.00</td>
<td>A Framework Designed For Social Scientists To Model Human Agent Behaviour In Social Networks</td>
<td>J. Wittmann* (Hamburg, D), R. Tobias (Dübendorf, CH)</td>
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<td>17.20</td>
<td>Experimental Design For Agent-Based Modelling Approaches</td>
<td>J. Wittmann* (Hamburg, D)</td>
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<td>17.40</td>
<td>Optimised Control Of Adaptive Current Consumers – A First Approach</td>
<td>U. Vogel*, J. Pei, M. Sonnenschein (Oldenburg, D)</td>
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<td>18.00</td>
<td>Time Series Modelling Of Water Quality Indicators</td>
<td>J. Alegue*, A. Gnauck (Cottbus, D)</td>
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<td>18.20</td>
<td>Modelling Of Phosphorus Changes In A Shallow River-Lake Ecosystem</td>
<td>A. Gnauck* (Cottbus, D)</td>
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### Thursday, Feb. 9, FH HS 7, 17.00 – 19.00
#### Optimzation in Multibody Dynamical Systems
*Session Organizer / Session Chair: Felix Chernousko and Nikolai N. Bolotnik*

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<td>17.00</td>
<td>Optimisation Of CVT Rocker Pin Chains</td>
<td>F. Pfeiffer*, H. Ulbrich, L. Neumann (München, D)</td>
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<td>17.20</td>
<td>Optimal Motions Of Certain Mutibody Systems In Resistive Media</td>
<td>F.L. Chernousko* (Moscow, Russia)</td>
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<td>17.40</td>
<td>Discrete-Time Control By Nonlinear Online Optimization On Multiple Shrinking Horizons For Underactuated Manipulators</td>
<td>D. Weidemann, N. Scherm, B. Heimann* (Hannover, D)</td>
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<td>18.00</td>
<td>Optimal Control Of Shock Isolation Systems On The Basis Of Three-Component Models</td>
<td>D.V. Balandin (N. Novgorod, RU), N. N. Bolotnik* (Moscow, RU), W. D. Pilkey, S. V. Purtsezov (Virginia, USA)</td>
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<td>18.20</td>
<td>Robot Placement In A Production Cell</td>
<td>K. Gotlih* (Maribor, SLO)</td>
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<td>18.40</td>
<td>Optimization Of Rail Wheel Profiles</td>
<td>R. Kovalev* (Bryansk, Russia)</td>
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### Thursday, Feb. 9, FH SEM101A, 17.00 – 19.00
#### Modelling and Simulation for Control System Design, Coordination and Supervision 2
*Session Organizer / Session Chair: Borut Zupančič*

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<td>17.00</td>
<td>Modelling And Simulation In Development And Tuning Of Intelligent Controllers</td>
<td>E. K. Juuso* (Oulu, FIN)</td>
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17.20 Optimal Multivariable Control Design Using Genetic Algorithms
M. Atanasijevic-Kunc*, A. Belic, R. Karba (Ljubljana, Slovenia)

17.40 Comparison Of Learning Algorithm Based On Sliding Mode And Neural Nets Control
By Real Time Simulation
M. Alexik*, M. Lučivjanský (Žilina, SVK)

18.00 Simulation Environment For The Investigation Of Automatized Cooperation Of
Marine Crafts
D. M. Carrillo, J.A. Lopez-Orozco, J. M. Giron-Sierra* (Madrid, E)

18.20 Modular Software Environment For General Purpose Autonomous Agents Simulation
And Control
S. Cifuentes, J. M. Girón-Sierra*, J.F. Jiménez (Madrid, E)

Thursday, Feb. 9, FH SEM101B, 17.00 – 19.00

**Optimal Control of Applications described by DAEs/PDEs/PDAEs**
Session Organizer / Session Chair: Kurt Chudej and Roland Griesse

17.00 Modeling Of An Mhd Free Surface Problem Arising In Cz Crystal Growth
R. Griesse* (Linz, A), A.J. Meir (Auburn, USA)

17.40 A Nonsmooth Newton’S Method For Control-State Constrained Optimal Control
Problems
M. Gerdts* (Hamburg, D)

18.00 Simulation And Optimal Control Of Molten Carbonate Fuel Cells
K. Chudej*, K. Sternberg, H. J. Pesch (Bayreuth, D)

18.20 Optimal Control Of Self-Organized Dynamics In Cellular Signal Transduction
D. Lebiedz*, S. Sager, O. S. Shaik, O. Slaby (Heidelberg, D)

18.40 Numerical Optimal Control Of The Wave Equation: Optimal Boundary Control Of A
String To Rest In Finite Time
M. Gerdts (Hamburg, D), G. Greif (Darmstadt, D), H. J. Pesch* (Bayreuth, D)

Friday, Feb. 10, FH Nöbauer FH 08, 9.00 – 10.00

**Plenary Lecture**
Session Chair: Felix Breitenecker

9.00 Simulation Of Systems With Dynamically Varying Model Structure
P. Schwarz* (Dresden, D)

Friday, Feb. 10, FH Nöbauer FH 08, 10.00 – 11.00

**Mechanical Systems 3**
Session Chair: Tatjana Stykel

10.00 A Simulation Package For Coordinated Motion Control Of A Fleet Of Under -
Actuated Surface Vessels
F. Arrichiello*, S. Chiaverini (Cassino, I)

10.20 On Free-Flying Redundant Space Robots With Nonholonomic Constraints
B. Schäfer*, B. Rebele, R. Krenn (Oberpfaffenhofen, D)

10.40 A Mathematical Model For The Prediction Of The Mechanical Properties Of Al-Killed
And Interstitial Free Steels
V. Colla, G. Bioli, M. Vannucci*, R. Valentini (Pisa, I)

Friday, Feb. 10, FH HS 2, 10.00 – 11.00

**Electrical and Power Systems 4**
Session Chair: Guiseppe Fusco

10.00 Causal Channel Inversion For Mimo Isi Systems: Equalization Error Modeling And
Robustness
N. Vukic*, H. Boche (Berlin, D)

10.20 The Peak-To-Average Power Reduction Problem – Fundamental Limits And
Connection With Fourier Analysis
H. Boche*, V. Pohl (Berlin, D)
Friday, Feb. 10, FH HS 3, 10.00 – 11.00

**Modelling in Biology and Physiology 3**

Session Chair: Michael Günther

10.00  Identifiable Reduced Complexity Model For The Human Respiratory And Cardiovascular System
M. Hirsch*, C. Furtmueller, L. del Re (Linz, A)

10.20  Hemodynamic Models For Education In Physiology
M. Hessinger, A. Holzinger (Graz, A), D. Leitner, S. Wassertheurer* (Vienna, A)

10.40  Evaluation Of Rupture Of Intracranial Saccular Aneurysms Basing On The Model Using Legendre Functions
K. Szafrański* (Szczecin, Poland)

Friday, Feb. 10, FH HS 4, 10.00 – 11.00

**Process Modelling 1**

Session Chair: Steffen Sommer

10.00  Bond Graph Modelling Of An Adsorption Process
A. Baaiu, F. Couenne*, Y. Le Gorrec, L. Lefèvre, M. Tayakout-Fayolle (Lyon, F)

10.20  Effect Of Non-Ideal Mixing On Control Of Cooled Batch Reactors
F. Caccavale, M. Iamarino*, F. Pierri, G. Satriano, V. Tufano (Potenza, I)

10.40  Modelling Of Temperature Conditions In Sterilisation Tunnel
A. Knoll, M. Atanasijević-Kune*, R. Karba (Ljubljana, SLO)

Friday, Feb. 10, FH HS 7, 10.00 – 11.00

**Modelling for and Control 3**

Session Chair: Dietmar P. F. Möller

10.00  Modelling Quadratic Suboptimal Controllers For Dynamic Interconnected Bilinear Systems
M. de la Sen, A.J. Garrido, J.C. Soto, O. Barambones, F.J. Maseda, I. Garrido (Bilbao, E), A. Ibáes*
(Barcelona, E)

10.20  Building An Unknown Input Observer (Uio) From A Bond Graph Model: A Geometric Approach
C. Pichardo-Almarza (Sheffield, UK), A. Rahmani*, G. Dauphin-Tanguy (Lille, F)

10.40  Intermittent And Periodic Observations In Kalman Filtering
L. Carotenuto, P. Pugliese* (Rende, I)

Friday, Feb. 10, FH Sem101A, 10.00 – 11.00

**Economic Systems**

Session Chair: Ute Vogel

10.00  Modelling Advertising Effects - A Hybrid Approach Using Odes And Cellular Automata
J. Wöckl*, D. Leitner (Vienna, A)

10.20  The Principle Of Parsimonious Modelling In Economic Growth Empirics - Comparing Data-Driven Approaches
B. Brandl*, C. Keber, M. Schuster (Vienna, A)

10.40  A Nonlinear Analytical Dynamic Model For The Iranian Male Labour Supply
A. Aghaei, H. Shakouri G.*, M. Karrari (Tehran, Iran)

Friday, Feb. 10, FH Nöbauer FH 08, 11.20 – 12.00

**Plenary Lecture**

Session Chair: Inge Troch

11.20  Modeling Energy Dependent Nuclear Reaction Probabilities From Pointwise Measurements Including Full Covariance Information
S. Tagesen* (Vienna, A)
Control-oriented Modelling of Advanced Multi-Link Manipulators

Session Organizer: Rainer Callies and Peter Rentrop
Session Chair: Rainer Callies

12.00 Object-Oriented Dynamics Modeling Of Walking Robots For Model-Based Trajectory Optimization And Control
R. Höpler (Munich, D), M. Stelzer*, O. von Stryk (Darmstadt, D)

12.20 Modeling And Optimal Control Of Multiple Constrained Manipulator Motion On Manifolds
S. Breun*, R. Callies (Garching, D)

12.40 Bilevel Optimization Of Container Cranes
C. Büskens, M. Knauer* (Bremen, D)

13.00 Intrinsic Modeling Of Mechanical Systems Based On Geometry
M. Schöberl*, K. Schlacher (Linz, A)

13.20 Recursive Modeling And Control Of Multi-Link Manipulators With Vacuum Grippers
R. Callies*, S. Fronzy (Munich, D)

Tool Integration and Interchange Formats for Hybrid Systems

Session Organizer: Manuel Remelhe and Sebastian Engell
Session Chair: Manuel Remelhe

12.00 Tool Integration For Hybrid Systems In Hycon
M.A. Pereira-Remelhe*, S. Engell (Dortmund, D)

12.20 Formal Verification Of Chi Models Using Phaver
D.A. van Beek, K.L. Man, M.A. Reniers, J.E. Rooda, R.R.H. Schifflers* (Eindhoven, NL)

12.40 Interchange Semantics For Hybrid System Models
A. Pinto*, L.P. Carloni, R. Passerone, A.S. Vincentelli (Berkeley, USA)

13.00 Siconos: A Software Platform For Modeling, Simulation, Analysis And Control Of Non Smooth Dynamical Systems.
V. Acary*, F. Pérignon (Montbonnot, F)

13.20 Modeling Visual Languages Based On Graph Transformation Concepts And Tools
C. Ermel*, H. Ehrig, K. Ehrig (Berlin, D)

Mathematical Modelling of Semiconductor Devices

Session Organizer / Session Chair: Martin Burger and Hans Kosina

12.00 Transparent Boundary Conditions For Quantum-Waveguide Simulations
A. Arnold* (Vienna, A)

12.20 Mathematical Modelling Of Semiconductor-Superconductor Hybrid Structures
F. Libisch*, S. Rotter, J. Burgdörfer (Vienna, A)

12.40 Kinetic Effects On The Transport Properties Of Semiconductor Devices Studied By Deterministic Solutions Of The Boltzmann - Poisson System
C. Auer*, F. Schürrer (Graz, A)

13.00 Effect Of Band Structure Discretization On The Performance Of Full - Band Monte Carlo Simulation
G. Karlowatz*, W. Wessner, H. Kosina (Vienna, A)

13.20 Simulation Of Microelectronic Structures Using A Posteriori Error Estimation And Mesh Optimization
M. Spevak*, R. Heinzl, P. Schwaha, T. Grasser (Vienna, Austria)

13.40 Inverse Dopant Profiling For Highly Doped Semiconductor Devices
M.T. Wolfram* (Linz, A), M. Burger

Process Modelling 2

Session Chair: Maja Atanasijevic-Kunc
A Mathematical Model For Detection Of A Partial Blockage In Pipelines Using Fluid Transients
M.S. Ghidaoui (Hong Kong, China), A. A. Kolyshkin*, I. Volodko (Riga, Latvia)

Reliability-Based Design Of Intermediate Storages Under General Stochastic Operational Conditions
É. Orbán-Mihálykö*, B.G. Lakatos, C. Mihálykö (Veszprém, H)

Black-Box And First-Principle Model Based Optimization Of Operating Technologies
F.P. Pach*, B. Balasko, S. Nemeth, P. Arva, J. Abonyi (Veszprem, HU)

Dynamic Modelling Of A Ph Neutralization Plant For Control
I. Rosdiazli*, D. J. Murray-Smith (Glasgow, UK)

Modelling And Optimization Of Hierarchical Structures
T. Riismaa* (Tallin, EST)

Modelling And Feedback Control Of The Startup Process Of Empty Cold Reactive Distillation Columns: The Fillup And Heating Case
S. Sommer*, J. Raischand, K. Sundmacher (Magdeburg, D)

Future Mobile Communication Systems
Session Organizer / Session Chair: Christoph Überhuber

Low Complexity Simulation Of Wireless Channels Using Discrete Prolate Spheroidal Sequences
F. Kaltenberger*, T. Zemen, C.W. Ueberhuber (Vienna, A)

Time-Variant Channel Prediction Using Time-Concentrated And Bandlimited Sequences - Analytic Results
T. Zemen*, C.F. Meckenbräucher(Vienna, A), B.H. Fleury(Aalborg, DK)

Advanced Mathematical Models For The Design Andoptimization Of Low-Interference Wirelessmulticarrier Systems
G. Matza, K. Grochenig, F. Hlawatscha, A. Klotz, G. Tauböck*, A. Skupcha (Vienna, A)

A Realistic Radio Channel Model Based On Stochastic Propagation Graphs
T. Pedersen*, B. H. Fleury (Aalborg, DK)

Maximum Entropy Mimo Wireless Channel Modelswith Limited Information
M. Guillaud*, M. Debbah (Sophia Antipolis, F)

Adaptive Algorithms For Mobile Digital Signal Transmissionmulticarrier Systems
M. Fornasier* (Vienna,A)

Mathematical Models of Cooperative Multiagent Systems
Session Organizer: Drago Matko
Session Chair: Richard Karba

Industrial Applications Of Robotoccer
P. Kopacek* (Vienna, A)

Transformed Net – Collision Avoidance Algorithm For Robotic Soccer
M. Saska*, M. Kulich, G. Klancar, J. Faigl (Prague, Czech Republic)

Decision Support By Simulation In A Robotic Soccer Domain
T.Krajník*, J.Faigl, L.Pfeucil (Prague, Czech Republic)

An Industrial Image Processing System For Fast Moving Objects
P. Kopacek*, M.-W. Han, B. Putz, E. Schierer, M. Würzl (Vienna, A)

Localisation Of Mobile Robots By Tracking Identical Colour Markers
G. Klancar* (Ljubljana, SLO), M. Brezak, I. Petrović (Zagreb, CRO), D. Matko (Ljubljana, SLO)

Closing Party
Chair: Inge Troch and Felix Breiteneccker
Acknowledgements, Mathmod Yo-yo Simulation Challenge, Announcement of 6th MATHMOD 2009
Programme for Accompanying Persons

Accompanying Persons are invited to participate in the Social Programme of the Conference. The Social Programme includes Get-Together-Party at TU Vienna, Reception at the City Hall, Evening at the Zwölf-Apostelkeller and Closing Party at TU Vienna.

Additionally, accompanying Persons have the possibility to explore the City Center of Vienna with Mrs. Barbara Achleitner. Mrs. Achleitner, a certified tourist guide, has arranged three beautiful walks passing the most famous sights, for example:

- St. Stephen’s Cathedral
- Figaro House
- Ruprechtskirche
- Judenplatz
- Freyung
- Hofburg Area
- Imperial Apartments
- Kaisergarten
- Albertina

Meeting point will be at the Registration Desk at the Conference Site, a tour lasts two to three hours. If weather conditions are not suitable, Mrs. Achleitner will take a somewhat different, but also interesting way (further information at detailed programme).

Last, but not least, we have reserved for Accompanying Persons two bottles of Conference Wine.
Freihaus (FH)
Building
second floor

SEM 101A, SEM 101B and the Meeting Room 101 are
on the 3rd floor (plan on the opposite side of this page)