# Annual Report of the McLeod Institute of Simulation Sciences, Hamburg, Germany, Period 2005/2006

August 2, 2006

**Center Activities**

Since its creation in October 1995, the former MISS Center at Clausthal University of Technology, has moved as German McLeod Institute of Simulation Science at the University of Hamburg in 1999. Meanwhile it has started several activities in the field of simulation in education and research. The McLeod Institute of Simulation Sciences, Hamburg Center, under the chair of Prof. Dr. Dietmar P. F. Möller, successfully applied together with the MISS Center CSU, Chico, Prof. Dr. Roy Crosbie, for several transatlantic grants from the European Commission Directorate Education and Culture and the U.S. DoE FIPSE, with the framework of the McLeod Virtual Campus Project, the USE-ME project (United States-Europe Multicultural Alliance in Education in Computer Science and Engineering) and the complementary activity project USE-eNET (United States –Europe e-Learning Network Alliance in Science and Engineering).

**Activities of  the MISS Center Hamburg in Education and Training**

Courses in:

- Computational Modeling and Simulation: Methodology and Applications (Möller)
- Discrete Time Systems Simulation and Optimization (Page, Wittmann)
- Modeling and Simulation in Solid States Physics (Möller)
- Simulation in Multimodal Transportation and Logistics (Möller)
- Computer Engineering (Möller)
- Project Management (Möller)
- Embedded Systems/Embedded Control (Möller, Mayer-Lindenberg)
- Robotics and Mobile Autonomous Systems (Koch, Möller)
- RoboCup – Soccer Playing mobile Autonomous Systems (Koch, Möller)

**Activities of the  MISS Center Hamburg in Research**

- Simulation and Optimization of Maritime Transportation and Logistics (supported by Industry)
- Simulation in Coronary Heart Diseases Diagnosis (supported by National Research Fund)
- Simulation in Mathematical Statistics (supported by National Research Fund)
- Simulation in Embedded Control Systems (supported by National Research Fund)
- Virtual and Augmented Reality in Rescue Engineering (supported by Industry)
- Virtual Reality in Tunnel Projects (supported by National Research Fund)
- Virtual Reality in Damming-Up Reservoir System (supported by National Research Fund)
- Nanotechnology (National Research Fund)

**Other Scientific MISS Center Hamburg Activities**

- Programm Chair ASIM 2005, Nurenberg, Germany
- Track Conference/Program Chair ESM 2005, Riga, Latvia
- Member Program Committee and Track Chair IEEE eit Conference 2005, Lincoln, Nebraska, 2005
- Member Program Committee 2nd EFUC Conference, Paris, France, 2005
- Member Program Committee Underground Infrastructure of Urban Areas 2005, Wroclaw, Poland
- Program Chair ASIM 2006, Hannover, Germany
- Track Conference/Programm Chair ESM 2006, Bonn, Germany

**MISS Center Hamburg Advances**
New grant from German Research Foundation (DFG) for 5 years establishing a Graduate College in Nano-structures "Taylored Metal Semiconductor Hybrid Systems" with 15 + 10 PhD grants


**MISS Center Hamburg Facilities**
In January 1999, the MISS Center Germany moved from Clausthal to Hamburg, into a new building with new facilities for the Chair of Computer Engineering and the Hamburg MISS Center. Due to that new situation, the Hamburg McLeod Center set up its own MISS Laboratory for Computer Modeling and Simulation, together with office space for MISS employees, Guest-Researchers, Guest- and/or Visiting Professors, Industrial Partners, etc. The MISS Center also participate from the following facilities:

- Laboratory for Computer Aided Intelligent Systems Engineering (**CAISE**)

- Laboratory for ICT-Systems and Data Management (**ISDM**)

- Laboratory for Java- and Web-Technologies  (**JAWE**)

- Laboratory for Medical Technology and Medical Informatics (**MIT**)

- Laboratory for Robotics and Mobile Autonomous Systems (**RAMSYS**)

- Laboratory for Embedded Systems & Embedded Control (**SMART**)

- Laboratory for Neuron-Informatics (**SYNAPSE**)

- McLeod Institute of Simulation Science German Chapter Hamburg und Labor System Simulation (**SYSSI**)

- Laboratory for Virtual & Augmented Reality (**VIRGIN**)

  Local Workstation Network consisting of:
  1 x Ultra Enterprise 450
  2 x SUN Ultra 60/1300
  Personal-Computers:
  2 x AMD Athlon 2000+
  1 x Dual Athlon 1 GHz
  1 Dual PIII 1 GHz
  13 x P4 3 GHz
  1 x P4 2,8 GHz
  4 x P4 2,4 GHz
  2 x P4 1,6 GHz
  3 x PIII 850
  3 x PII 400
  1 x PII 300
  2 x IBM compatible PC with 80386 Processors  (Local Bus)
  1 x SlimNote 5100 C
  2x IBM Thinkpad R31
  1x Apple Powerbook G4
  1x Toshiba 4000 CDT
  1x Dell Inspirion 4100
  Robots:
  Kobra RS Robot System
  Jungheinrich Industrial-Robot
  GRAU-Industrial Robot System
  Board Production Facility (LPKF) containing:
  Fräsbohrplotter ProtoMat 95s
  SMD Device ZelPlace 220
  Pressure contacting facility MiniContac II
  Multilayer Press MultiPress II
  Reflow Oven ZelFlow RO4


**MISS Hamburg Center Simulation Tools**
The principle simulation software used by the current center members include:
ARENA, BIOPSI, DORA, FuzzySoft, ISSOP, MATLAB, ModelMaker, SIMULINK, SIMPLEX II; ProModel; COMSOL Multiphysics Tool

**MISS Hamburg Center Highlights**

The Center intends to combine basic research of simulation methodology coupled tightly with applications in the various fields described under research activities. As a delight result we are able announcing a reasonable amount of research contracts with the industrial side as well as with national grants. Moreover the Center Highlights covers guest visits form different locations:

- Dr. Poul Bonde, Aarhus University, Aarhus, Danmark, Research work on ECTS in Higher Education Programs of the EU

- Prof. Dr. Akilesh; Indian Institute of Science, Bangalore, India, Research work on Knowledge Engineering and Change Management

- Mr. Sanjib Ghosh, DaimlerChrysler Research and Technology India Pvt. Ltd. Bangalore, India, Research work on Embedded Computing Systems

- Prof. Dr. David Murray-Smith, University of Glasgow, Scottland, Research work on Discrete Event Modeling and Simulation and USE-eNET Project

- Prof. Dr. Hamid Vakilzhadian, University of Nebraska, Lincoln, USA, Research work on Embedded systems and VHDL, and USE-eNET Project

- Dr. R. Haas, Daimler-Chrysler, Research and Technology Center at Bangalore, India. Research topics in IT-Security

- Prof. Dr. E. Godehard, Universität Düsseldorf, Germany, Natural Family Planning Project

- Dr. Luisegard Ayalew, University Addis Abbeba, Ethiopia, Modeling and Simulation in Geotechnology


**MISS Hamburg Center Thesis: PhD, MSc**

**PhD:**
**Period 2005/2006**

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|---|---|---|
| Christian Scherpe | B. Wolfinger (K. Kaiser) | Emulation gekoppelter Rechnernetze mit lastabhängigem Verzögerungs- und Verlustverhalten |

**MsC:**
**Period 2005/2006**

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|---|---|---|
| Olaf C. Bauer | J.W. Schmidt (K. Kaiser) | Integration verteilter Geodatendienste: Ein Internetporzal für die Metropolregion Hamburg |
| Thomas-Peter Czudnochowski | D.P.F. Möller (J.Wittmann) | Dynamisches Testen von Quellcode im Bereich mobiler autonomer Systeme |
| Ingo Brehmer | B.Wolfinger (K. Kaiser) | Realisierung eines IP-basierten Netzemulators |
| Niels Hoffmann | K. Kaiser (J.W. Schmidt) | Offene Integration von Geo- und Planungsdiensten in ein Internet-Contentportal |
| Katharina Daskalaki | E. Wolfinger (K. Kaiser) | Architektur und adaptive Algorithmen zur Qualitätsverbesserung von Videokommunikation aus Endbenutzersicht |
| Görgün Kilic Zaza Jgarkava | M. Lehmann (K. Kaiser) | Eignung eines Java Server Faces Frameworks für die Bedienung unterschiedlicher Client-Typen |
| Imad Gourdalo | B. Page (K. Kaiser) | Entwurf und Implementierung von hochregallagerspezifischen Modellkomponenten für das Simulationsframework DESMO-J |
| Andreas Ruge | D.P.F.Möller (W.Menzel) | Konzept und Realisierung zur Anzeige und Bearbeitung interaktiver Skripte |
| Jan Bendler | D.P.F. Möller (W.Hansmann) | Fuzzylogik in der four legged league – Objektidentifikation unter Verwendung unscharfer Mengen |
| Mark Beck Timm Schwemann | D.P.F. Möller (W.Hansmann) | Identifikation und Analyse von Bewertungsmethodiken sowie –kriterien und ihre Übertragbarkeit auf den Bereich des eLearnings |

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| Christian Blechschmidt | M.Lehmann (D.P.F.Möller) | Statistischer Vergleich von Faktorisierungs- und Zerlegungsverfahren zur Zuverlässigkeitsanalyse von Netztopologien |
| Allaithy Raed | D.P.F.Möller (W.König) | Konzeption und Implementierung eines verteilten Systems zur Lastverteilung von hardwaregebunde-nen Softwarebestandteilen (Konzepte zur Laster-mittlung und Lastverteilung) |

## MISS Center Hamburg Publications:

Bolte, M.; Maier, G.; Möller, D. P. F.: Understanding and predicting the Electronic and Dynamic Behavior of Nanoscale Magnetic Random Access Memory (MRAM) Cells using Micromagnetic Modelling and Simulation, In: 19th European Conference on Modelling and Simulation, pp. 574-579, Eds. Y. Merkuryev, R. Zobel, E, Kerkhoffs, SCS Publ. House, Ghent, 2005

Czudnochowski, Th.-P.; Koch, B.; Wittmann, J.: Dynamisches Testen von Quellcode für mobile autonome Systeme am Beispiel der Lego-Robotikbaukästen mit dem Simulationstool „LejoSim". In: Hülsemann, F., Kowarschik, M., Rüde, U.(Eds): Simulationstechnique, 18th Symposium in Erlangen 2005, SCS Publishing House, Erlangen 2005, ISBN 3-936150-41-9, pp. 478-481

Himstedt, K.: An Optimistic Pondering Approach for Distributed Game-Tree Search. ICGA Journal, Vol. 28, No. 2, pp. 77-90, 2005, ISSN 1389-6911

Körber, C.; Möller, D. P. F.; Kätsch, C.: Multi-Channel Texture Classification applied for Feature Extraction in Forestry, In: Proceedings 2005 International IEEE Conference on Electro Information Technology, Lincoln, Nebraska, May 22-25, 2005, pp. 433-438, Ed. H. Vakilzadian, H. Sharif, S. Seth, K. Sayood, IEEE Publ., ISBN 0-7803-9223-7, 2005

Möller, D. P. F.: Business Objects as Part of a Preprocessing based Micro Array Data Analysis, In: IEEE 2005 Electro/Information Technology Conference, Ed. H. Vakilzadian, IEEE Publ. House, 2005

Möller, D. P. F.: Micro Array Data Analysis based on Business Objects as part of a Workflow related Gene Expression, In: 19th European Conference on Modelling and Simulation, Eds. Y. Merkuryev, R. Zobel, E, Kerkhoffs, SCS Publ. House, Ghent, 2005

Möller, D. P. F.: Computational Modeling and Simulation of Reconfigurable Responsive Embedded Computing Systems, In: 19th European Conference on Modelling and Simulation, pp. 557-573, Eds. Y. Merkuryev, R. Zobel, E, Kerkhoffs, SCS Publ. House, Ghent, 2005

Möller, D. P. F.: Micro Array Data Analysis based on Business Objects as Part of a Wokflow related Gene Expression, In: 19th European Conference on Modelling and Simulation, pp. 616-621, Eds. Y. Merkuryev, R. Zobel, E, Kerkhoffs, SCS Publ. House, Ghent, 2005

Möller, D. P. F.; Körber, C., Kätsch, C.: Texture Classification applied on Aerial Imagery in Forrestry, In: 19th European Conference on Modeling and Simulation, Riga, Lativa, June 1-4, 2005, pp. 653-657, Eds. Y. Merkuryev, R. Zobel, E, Kerkhoffs, ECMS Publ., Nothingham, UK, ISBN 1-84233-115-9, 2005

Möller, D.P.F; Hanusch, C.; Körber, C.; Zemke, C.; Maas, K.: Earthfalls as a result of salt leaching effects in the underground – application of modern IT concepts in underground analysis. In: Underground Infrastructure of urban areas, Hrsg. C.Madryas & A.Kolonko Ofiagna Wydawnicza Publ., Wroclaw, 2005 pp. 238-253

Möller, D. P. F., Körber, C., Zemke, C., Hanusch, C., Maas, K. Earth Falls as a Result of Salt Leaching Effects in the Underground – Application of Modern IT Concepts in Underground Analysis, In: Underground Infrastructure of Urban Areas, pp. 238-253, Eds.: C. Madryas, B. Kolonko, Oficyna Wydrawoninicza Publ., Wrozlaw, 2005

Wittmann, J.; Beyene, B.; Möller, D.P.F.: Modelling and Simulation in an Internet-Based Learning Environment for Sustainable Agricultural Development in Ethiopia. In: Hülsemann, F.; Kowarschik, M.; Rüde, U.(Eds): Simulationstechnique, 18th Symposium in Erlangen 2005, SCS Publishing House, Erlangen 2005, ISBN 3-936150-41-9, pp. 676-681

Wittmann, J.: On validation of individual-based models. In: Baillie-de Byl, P., Rimane, R. (Eds): 6th Workshop on Agent-Based Simulation, Erlangen 2005, SCS Publishing House, Erlangen 2005, ISBN 3-936150-44-3, pp. 23-27

Wittmann, J.; Thinh, N.X.: Simulation in Umwelt- und Geowissenschaften: Workshop Dresden 2005, Shaker-Verlag, Aachen 2005, ISBN 3-8322-4051-9

Möller, D. P. F.: Requirements for Continuing a Project After the Grant", Canada-EC-US Program in Higher Education, Washington DC, U.S.A., December 2004

Möller, D. P. F.: EC Research Project Proposals GO-EUROPE and LITHO-JT, EFUC Conference, Wroc-

law, Poland, November 2005

Möller, D. P. F.: IIS: Interoperable Industry Solutions, EFUC Conference, Vilnius, Lithuania, May 2005

Möller, D. P. F., Crosbie, R.E.: United States – Europe e-Learning Network (USE_eNET) in Education, SCS Spring Simulation Conference, Huntsville, Alabama, April 2-7, 2006, pp.. 1-4

Hess, S., Möller, D. P. F., Shar, H., Schroer, B., J.: Internet Based Transatlantic Simulation Student Project SCS Spring Simulation Conference, Huntsville, Alabama, April 2-7, 2006, pp. 543-547

Möller, D. P. F.: HLA Simulation For Land Based Transportation, SCS Spring Simulation Conference, Huntsville, Alabama, April 2-7, 2006, pp. 548.552

Hess, S., Möller, D. P. F., Wittmann, J., Vakilzadian, H.: E-Learning Applied In Transportation: A Case Study Approach For Driving Licenses, SCS Spring Simulation Conference, Huntsville, Alabama, April 2-7, 2006, pp. 553.557

Möller, D. P. F., Crosbie, R. E.: United States – Europe e-Learning Network (USE_eNET) in Education: A Follow-up Report, SCS Summer Simulation Conference, Calgary, Canada, July 31 – August 3, 2006 (accepted paper)

Möller, D. P. F., Vakilzadian, H., Schroer, B. J., Crosbie, R. E.: Architectural Concepts For Integrating Simulation Into The USE_eNET Framework, SCS Summer Simulation Conference, Calgary, Canada, July 31 – August 3, 2006 (accepted paper)

Möller, D. P. F., Vakilzadian, H., Crosbie, R. E.: Soccer Playing Robots: A Transatlantic Engineering Student Team Project In The USE_eNET Project, SCS Summer Simulation Conference, Calgary, Canada, July 31 – August 3, 2006 (accepted paper)

Möller, D. P. F., Wittmann, J.: Strategies in Modeling and Simulating Traffic Flow, SCS Summer Simulation Conference, Calgary, Canada, July 31 – August 3, 2006 (accepted paper)

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