

# Curriculum Vitae

Jesper Mosegaard

March 29, 2007

Born 18/10 - 1979  
Address Langørvej 137  
8381 Tilst  
Denmark  
Phone +45 87 36 05 04

## Work

Feb 2007 Assistant Professor at the Institute of Information and Media Studies, University of Aarhus  
2006-2007 Temporary Lecturer (Amanuensis) at the Institute of Information and Media Studies, University of Aarhus (6 months)

## Education

2003-2006 PhD from the Department of Computer Science, University of Aarhus  
2001-2003 MSc (Cand. Scient.) from the Department of Computer Science, University of Aarhus  
1998-2001 Bachelor in Computer Science and Multimedia from the University of Aarhus  
1995-1998 Kolding Amts Gymnasium

## Diploma

Received the *IDA-IT dimmiteddiplom* fall 2003 (The Society of Danish Engineers, graduate diploma ) for the masters thesis *Realtime Cardiac Surgery Simulation* for “Outstanding execution of it-related thesis”

## Reviewing

ACM SIGGRAPH Tertiary reviewer for ACM SIGGRAPH 2007

SANDBOX Committee member 2007 (ACM SIGGRAPH VIDEOGAME SYM-  
POSIUM)

## Scholarship

Aug.2002-Jul.2003 Oticon Scholarship for masters thesis year (100.000 danish  
kr)

## Publications

### Dissertations

- [1] Mosegaard, J. *Cardiac Surgery Simulation - Graphics Hardware meets Congenital Heart Disease*. PhD thesis, 2006.  
Evaluation Committee:  
Dr. Mark Harris, NVIDIA Ltd, United Kingdom  
Professor Peter Johansen, University of Aarhus, Denmark  
Professor Mogens Nielsen, Univeristy of Aarhus, Denmark.
- [2] Mosegaard, J.: *Realtime Cardiac Surgery Simulation*. Masters Thesis, 2003.

### Full Papers

- [3] Mosegaard, J., Carstensen, B.S, Rasmusson, A., Sørensen, T.S.:  
Smooth Haptic Interaction from Discontinuous Simulation Data. *Medicine Meets Virtual Reality 15*, Long Beach, USA, 2007; 328-333
- [4] Sørensen, T.S., Greil, G.F., Hansen, O.K., Mosegaard J.: Surgical simulation - a new tool to evaluate surgical incisions in congenital heart disease? *Interactive CardioVascular and Thoracic Surgery* 2006;5:536-539
- [5] Sørensen, T.S., Mosegaard, J.: An Introduction to GPU Accelerated Surgical Simulation. *3rd Symposium on Biomedical Simulation*. Zurich, Switzerland. Lecture Notes in Computer Science (4072) 2006; 93-104
- [6] Sørensen, T.S., Mosegaard, J.: Haptic Feedback for the GPU-based Surgical Simulator. *Medicine Meets Virtual Reality 14*, Los Angeles, USA, 2006. 523-528

- [7] Mosegaard, J., Sorensen, T. S.: Real-time Deformation of Detailed Geometry Based on Mappings to a Less Detailed Physical Simulation on the GPU. *Eleventh Eurographics Workshop on Virtual Environments*, Ålborg, Denmark, 2005; 105-110
- [8] Mosegaard, J., Sorensen, T. S.: A GPU Accelerated Surgical Simulator for Complex Morphology. *IEEE Virtual Reality*, Bonn, Germany, 2005; 147-153
- [9] Mosegaard, J., Herborg, P., Sorensen, T. S.: A GPU Accelerated Spring Mass System for Surgical Simulation. *Medicine Meets Virtual Reality 13*, Long Beach, California, USA, 2005; 342-348
- [10] Mosegaard, J. and Bennedsen, J.: A Framework for Narration and Learning in Educational Multimedia. *World Conference on Educational Multimedia, Hypermedia & Telecommunications (Ed-Media 2003)*, Honolulu, Hawaii, USA, 2003; 99-106
- [11] Andersen, P.B., Bennedsen J., Brandorff, S., Caspersen, M.E., Mosegaard, J.: Teaching Programming to Liberal Arts Students - a Narrative Media Approach. *The 8th Annual Conference on Innovation and Technology in Computer Science Education*, Thessaloniki, Greece, 2003; 109-113

### Short Papers and Extended Abstracts

- [12] Stawiaski, J., Mosegaard, J., Sørensen, T.S.: Virtual Open Heart Surgery: Segmentation. *Medicine Meets Virtual Reality 2007*, Long Beach, USA, 2007; 448-450
- [13] Sørensen, T.S., Stawiaski, J., Mosegaard, J.: Virtual Open Heart Surgery: Obtaining Models Suitable for Surgical Simulation. *Medicine Meets Virtual Reality 2007*. Long Beach, USA, 2007; 445-447
- [14] Mosegaard, J., Sørensen, T.S.: Technical Aspects of the GPU Accelerated Surgical Simulator. *SIGGRAPH Application Sketches*. Boston, USA 2006
- [15] Mosegaard, J.: LR-Spring Mass Model for Cardiac Surgical Simulation. *Medicine Meets Virtual Reality 12* Newport Beach, California, USA, 2004; 256-258
- [16] Mosegaard, J.: Parameter Optimisation for the behaviour of Elastic Models over Time. *Medicine Meets Virtual Reality 12*. Newport Beach, California, USA, 2004; 253-255

## Abstracts

- [17] Sørensen, T.S., Mosegaard, J., Hansen, O.K.: Virtual Morphological Reconstructions for Preoperative Planning and Surgical Training. *XXXVI Nordic Meeting in Pediatric Cardiology*. Aarhus, Denmark, 2006
- [18] Sørensen, T.S, Mosegaard, J., Greil, G.F., Hjortdal, V., Hansen, O.K.: Preoperative Planning by Surgical Simulation on Patient-specific High-resolution Virtual Models. *The Fourth World Congress of Pediatric Cardiology and Cardiac Surgery*, Buenos Aires, Argentina, 2005

## Video and Exhibitions

- [19] Sangild, T.S., Mosegaard, J., Greil, G.F., Miller, S., Seeger, A., Hansen, O.K., Sieverding, L.: Virtual Cardiotomy for Preoperative Planning. *Circulation*. 115(9):e312, March 6, 2007
- [20] Sørensen, T.S., Mosegaard, J.: Virtual Open Heart Surgery - Training complex surgical procedures in congenital heart disease. *ACM SIGGRAPH Emerging Technologies*. Boston, USA 2006
- [21] Sørensen, T.S., Mosegaard, J.: Surgical Planning in Congenital Heart Disease by Means of Real-Time Medical Visualisation and Simulation. *SIGGRAPH 2005 Computer Animation Festival's Animation Theater*, Los Angeles, USA, 2005. Also shown at the *Virtuality Conference 2005*

## Conference Participation

- Feb 2007 Medicine Meets Virtual Reality 2007 (MMVR 15), Long Beach, USA, Feb. 6-9 2007.
- Aug 2006 The 33rd International Conference and Exhibition on Computer Graphics and Interactive Techniques, SIGGRAPH, 30 July - 3 August, 2006.
- Jun 2006 Visionday, Copenhagen, Denmark, June 1-2, 2006
- Oct 2005 Ninth Immersive Projection Technology Workshop together with the Eleventh Eurographics Workshop on Virtual Environments (IPT & EGVE Workshop 2005), Ålborg, Denmark. Oct. 6-7, 2005.
- Jan 2005 Medicine Meets Virtual Reality (MMVR13), Long Beach, USA. Jan. 26-29, 2005.
- Jan 2005 SummIT05, Aarhus, Denmark. Jan. 19-20, 2005. (*Workshop and demonstration*)

- Jun. 2004 Graphical Visionday 2004. Copenhagen, Denmark. Jun. 4, 2004.
- May 2004 3D Festival. Copenhagen, Denmark. May. 3-6, 2004.
- Jan. 2004 Medicine Meets Virtual Reality (MMVR12). Newport Beach, USA. Jan. 14-17, 2004.
- Jun. 2003 ED-MEDIA World Conference on Educational Multimedia, Hypermedia & Telecommunications. Honolulu, Hawaii, June 23-28, 2003.
- Jan. 2003 Medicine Meets Virtual Reality (MMVR11). Newport Beach, USA. Jan. 15-17, 2003
- Jun. 2002 Innovation and Technology in Computer Science Education (ITiCSE2002). Århus, Denmark. June 24-26 2002

## **Project experience**

### **Stabilizing the Cardiac Surgery Simulator**

Co-applicant for funding from the Danish Heart Association for two student programmers (18,5 hours/week) for 8 months (225.000 danish kroner). Responsible for the two student programmers (Allan Rasmusson and Bo Søndergaard Carstensen). (grant #05-10-B359-A657-22265 from the Danish Heart Foundation)

### **Medical Visualization and Simulation**

Co-applicant in the application for 2.8 million danish kroner for medical visualization and simulation in the case of congenital cardiac defects. (grant #2059-03-0004 from the Danish Research Council's Program Committee on IT-Research)

### **Lingoland**

Responsible for three part time student programmers (Morten Bogh, Rasmus Johansen and Jonatan Yde) for one year (2003-2004).

## **Supervision**

- 31.01.2008 (Expected) Thomas Gregersen and Ole Daugaard, "Communication and Learning Theory in System Development" with Helle Mathiasen.
- 31.07.2007 (Expected) Bjarne Knudsen, "Physical based Character Animation for full-body interaction and large-screen visualization" with Peter Møller-Nielsen

- 31.07.2007 (Expected) Allan Rasmusson, “Level of Detail in GPU based physics simulation” with Thomas Sangild Sørensen and Peter Møller-Nielsen
- 16.02.2007 Peter Trier, “Virtual Ear Simulator” with Peter Møller-Nielsen
- 31.03.2006 Søren Aaen Madsen, “Registration and Segmentation of muskular tissue in jaw using mutual information in CT and MR scannings” with Peter Møller-Nielsen
- 24.10.2005 Michael Bræmer Nielsen, “Real-time Fracture of Brittle Materials in a Game Setting” with Thomas Sangild Sørensen and Peter Møller-Nielsen

## Teaching Experience

- 2007S Teaching “Systemdevelopment and Programming” at the Institute of Information and Media Studies.
- 2006F Teaching “Computer Game Development” at the Department of Computer Science
- 2006F Teaching “Game Basics” at the Multimedia Educations
- 2006F Teaching “Introduction to Programming” at the Institute of Information and Media Studies
- 2005F Teaching “General Purpose Computation using the GPU” (2. Quarter) course at the Department of Computer Science
- 2004F Teaching “General Purpose Computation using the GPU” (2. Quarter) course at the Department of Computer Science
- 2004F Teaching “Surgical Simulation” study group (1. Quarter) at the Department of Computer Science
- 2003F Teaching “Multimedia Programming” course (2. Quarter) at the Department of Computer Science
- 2003F Student Assistant in “Introduction to Programming” (1. Quarter) at the Department of Computer Science (Michael Edelgaard Caspersen)
- 2001F Student Assistant in “Informationsprocessor” (Informationsprocesses) at the Institute of Information and mediascience. (Jens Bennedsen)
- 2001S Student Assistant in “Programmering og systemudvikling” (Programming and systemdevelopment) at the Institute of Information and mediascience. (Claus Bjerre)
- 2000F Student Assistant in “Værktøj i Computerarbejde” (Tools in computerwork) at the Institute of Information and mediascience. (Steffen Brandorff)

## Other Invited Talks and Lectures

- 01.06.2006 “Cardiac Surgery Simulation Accelerated on Graphics Hardware” talk at the Medical Visionday, DTU, Copenhagen.
- 30.03.2006 Presenting the Cardiac Surgery Simulator for the Bulgarian President, Georgi Parvanov, during his visit of Katrinebjerg. This visit was a part of his official visit in Denmark. The president was introduced to Katrinebjerg, and subsequently saw two projects of which the Surgical Simulation Project was one.
- 03.02.2006 “Medical Visualization and Simulation: Virtual Surgery” Kick-off meeting for the Virtual Butcher Project (Danish Meat Research Institute), Copenhagen.
- 11.11.2005 “CAVI and Surgical Simulation” Third Brainstorm meeting, Medical Imaging and Computer Games, Helsinki, Finland.
- 02.11.2005-03.11.2005 “Computer Graphics in CAVI” Practical experience with studie at the Faculty of Science for high-school students. (Studiepraktik for 3G’ere)
- 06.05.2005 “How to use the capabilities of modern graphics processors for non-graphic problems”, Parallel Programming course (Peter Møller-Nielsen), Department of Computer Science, University of Aarhus.
- 25.02.2005 “Computer Graphics”. Practical experience with studies at the Faculty of Science for high-school students, 2005. (Studiepraktik 2005)
- 16.02.2005 “Medical Simulation”, Simulation course (Peter Bøgh Andersen), Institute of Information Science, University of Aarhus.
- 20.10.2004 “Surgery Simulation”, MRI course (Steffen Ringgaard), Biomedical Engineering, University College of Aarhus.
- 28.04.2004 “Ph.d-project about Realtime Simulation of Surgical Procedures“, “Datalærerforeningen og DAIMI’s endagsarrangement i datalogi”.
- 16.04.2004 “How to use the capabilities of modern graphics processors for non-graphic problems”, Parallel Programming course (Peter Møller-Nielsen), Department of Computer Science, University of Aarhus.
- 30.10.2003 “Cardiac Surgery Simulation”, Marie Curie Training Site, Advanced Medical Imaging and Spatial Statistics, University of Aarhus.
- 23.10.2003 “3D Cardiac Modelling”, Cardiac MRI course (Steffen Ringgaard), Biomedical Engineering, University College of Aarhus.

## Relevant work

- 2002S Student-programmer and active part in the research of the Lingoland group under the FlexNet project. (half time job)
- 2001F Student-programmer in the course “Multimedia programmering” (Multimedia Programming) at IT-VEST. (Jens Bennedsen)
- Aug.2001 Student-programmer and active part in the research of the Lingoland group. (half time job)
- 1999-2000 Unpaid work in the editorial staff of daimiposten (a magazine for the Department of Computer Science in Aarhus)
- 1998-2000 Computerassistant at “Psykiatrisk Videncenter”

## Selected media appearance

- 31.07.2006 Boston Globe, “3D images let surgeons rehearse before they cut”. (About the SIGGRAPH exhibition)
- 23.06.2006 Computerworld, “Sundheds-it: En virtuel hjerteoperation”. (About my PhD project and the presentation at SIGGRAPH in Boston)
- 18.01.2006 TV2, TV2 Nyhederne: “Danske forskere på vej med verdensnyhed. De har tryllet computerskærmen om til et operationsbord”. 2 min 30 sec. (Danish national TV channel, about the cardiac-project)
- 02.11.2005 AUH - Forskning og Klinik, Tema: Højteknologi, Aarhus Universitetshospital, 5. årgang nr. 2: “Modeller i 3D giver fælles sprog på hjerteområdet” (Models in 3D give a common language for heart surgeons)
- 29.01.2005 P1, Harddisken: “Det virtuelle 3D-hjerte”. 10 min. (Danish national radio about my ph.d. project)
- 28.01.2005 DK4, “Danske erhvervsucceser - pervasive computing i Danmark”. 30 min (interview 2 min). Repeated numerous times throughout 2005.
- Nov.2004 IT-City Katrinebjerg 2004 Magazine and video . “Surgeons train cardiac surgery on virtual hearts”.
- 11.10.04 Campus nr. 3, University of Aarhus newspaper. “Computer-kirurgi” (Computer surgery)
- 22.01.04 Katrinebjerg newsletter jan 2004. “Et hjertebarn” (About my masters thesis and continuation into ph.d. project)
- Oct.2003 it-vest NYT nr. 9. “Aloha Hawaii - om vejen til ferieparadiset” (It-vest newsletter on conference participation for Lingoland)