

Curriculum Vitae

Andrei V. Sherstyuk

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EDUCATION

Ph.D. Computer Science, Monash University, Australia. 1999
M.S. Computer Science, California Institute of Technology, USA. 1994
B.S. Physics, Novosibirsk State University, USSR. 1989

DISSERTATION

Convolution Surfaces in Computer Graphics

EMPLOYMENT

University of Hawaii, Telehealth Research Institute – Research Scientist 2002 – present
SquareUSA Inc. – Research and Development. 1999 – 2002
NCR/AT&T Company – Consultant. 1993 – 1994
NCR Corporation – Consultant. 1991 – 1993
Institute of Telemetry, Academy Of Science, USSR – Research Fellow. 1986 – 1991

RESEARCH INTERESTS

Virtual Reality, Augmented Reality, Mixed Reality Systems.
3D Human Computer interfaces and metaphors.
Motion representation and editing.
Shape representation, level of detail.
Implicit surfaces and convolution surfaces: modeling, rendering, animation.
Modeling of natural phenomena with implicit surfaces.
Physically-based modeling and simulation.
High-quality rendering.

SELECTED PUBLICATIONS

Andrei Sherstyuk, Kin Lik Wang, Anton Treskunov, Jarrell Pair. View Enhancement Techniques for Scene Exploration and Object Selection in Virtual and Mixed Environments *4th International Workshop on the Tangible Space Initiative*, Nara, Japan, November 2007.

Andrei Sherstyuk, Dale Vincent, Jack Jin Hwa Lui, Kathleen Kihmm Connolly, Kin Lik Wang, Stanley M Saiki, Thomas P. Caudell, Design and Development of a Pose-Based Command Language for Triage

Training in Virtual Reality, *IEEE Symposium on 3D User Interfaces*, Charlotte, North Carolina, USA, March 10-14, 2007.

Andrei Sherstyuk, Jarrell Pair, Anton Treskunov, Optical Sight Metaphor for Virtual Environments, *IEEE Symposium on 3D User Interfaces*, Charlotte, North Carolina, USA, March 10-14, 2007.

Andrei Sherstyuk, Convolution Surfaces in Computer Graphics (in Russian)
Open Systems, Open Systems Publications, Moscow, Russia, 4(48), 2000, pp 72-76.

Andrei Sherstyuk, Kernel functions in convolution surfaces: a comparative analysis
The Visual Computer Journal - International Journal of Computer Graphics, Springer-Verlag, NY, USA, ISSN: 0178-2789, Vol 15, No 4, 1999, pp 171-182.

Andrei Sherstyuk, Fast ray tracing of implicit surfaces
The International Journal of the Eurographics Association, Computer Graphics Forum, Blackwell Publishers, Oxford, UK, ISSN: 0167-7055, Vol 18, No 2, 1999, pp 139-148.

Andrei Sherstyuk, Interactive shape design with convolution surfaces,
Shape Modeling International (SMI'99), Aizu - Wakamatsu, Japan, 1-4 March, 1999.

Jon McCormack, Andrei Sherstyuk, Creating and rendering convolution surfaces
The International Journal of the Eurographics Association, Computer Graphics Forum, Blackwell Publishers, Oxford, UK, ISSN: 0167-7055, Vol 17, No 2, 1998, pp 113-120.

Andrei Sherstyuk, Ray tracing with selective visibility
Journal of Graphics Tools, A K Peters Ltd, Wellesley MA USA, 1(4) 1997, pp 41-46.

PROJECTS

University of Hawaii, Telehealth Research Institute, USA, 2002 – present

- **VIEW ENHANCEMENT TECHNIQUES FOR VIRTUAL ENVIRONMENTS**
A family of novel techniques in user-interface was developed and implemented. The results were presented and published at IEEE VR conference in 2007. Additional user validation experimental studies were conducted at the School of Medicine, UH, in 2007.
- **VR TRIAGE**
Design and development of a prototype of the system for conducting triage in virtual reality. Supervised development of virtual patients and 3D effects, designed and implemented a novel command language interface based on human poses and gestures. The results were presented and published at IEEE VR conference in 2007. VR Triage system was extensively used in additional sense of presence studies at University of Hawaii in 2006, navigation-control studies at Medicine Meets Virtual Reality conference in 2007, interface-evaluation studies at School of Medicine, UH, in 2007.
- **VIRTUAL REALITY BEHAVIORAL HEALTH**
Directed development of a Virtual Beach simulator for biofeedback and pain control experiments. Duties and responsibilities: managing a team of artists doing 3D modeling and animation; hardware configuration, setup and testing; software development for animation and shape representation; optimization techniques for 3D visualization; 3D sound; human-computer interactions; integration with the motion tracking system. The system is currently installed at the Tripler Army Hospital in Hawaii, Department of Psychology.

- **VIRTUAL HEMATOMA**
Development of an immersive Virtual Reality hematoma simulator for medical students. Provided integration with Maya authoring software for the production pipeline: Maya plugins to export models, shaders and animations. Character setup for a skeletal-based animation in Maya.
- **VIRTUAL KIDNEY**
Development of a human kidney simulator for medical students.
- **TELEMEDICINE CURRICULUM**
Participated in writing a Web-based curriculum for civil and military doctors, with an emphasis on Simulation and Virtual Reality applications.
- **PRESENTATIONS**
Presentations of virtual reality projects at various meetings and conferences: development, on-site technical support, live demonstrations, data collection.
VR Triage, experimental study on sense of presence, University of Hawaii, 2007

VR Triage, exhibition demo, MMVR 2007 (Medicine Meets Virtual Reality), Long Beach CA, 2007

Virtual Beach, Hematoma, Human Kidney exhibition demo at AIMS Meeting for members of Congress, Washington DC, 2005 (Educating America about the value of Medical Simulation).

Virtual Beach, Hematoma, Human Kidney, exhibition demo, MMVR, Long Beach CA, 2005

Virtual Hematoma live collaborative presentation at the Techs in Paradise Conference, University of Hawaii, 2004

Virtual Hematoma problem based learning case, experimental study, University of Hawaii, 2004

Virtual Beach live presentation. MMVR Long Beach CA, 2004

SquareUSA Inc, USA, 1999 – 2002

- **“FINAL FANTASY XI” GAME FOR PLAYSTATION 2**
Participated in development of authoring tools for the production of the game: export of shapes, shaders and motion from Maya to Playstation 2 format. Developed a skeleton-based animation system for compact motion representation and editing with data compression.
- **“FINAL FANTASY: THE SPIRITS WITHIN” CG FEATURE FILM**
Participated in development of physically based simulation system for animation of flexible objects, such as clothes and hair, used in production of the film.
Developed Maya (tm) plugins for interactive simplification of polygonal shapes with feature preservation; plugins for fast visualization of animated sequences with high-quality rendering.
- **SIGGRAPH PRESENTATIONS**
SIGGRAPH'2001: real-time 3d cinematic demo of the Final Fantasy movie sequence on a PC, 135 seconds, two CG characters. Character setup, Maya export, motion compression.

SIGGRAPH'2000: real-time 3d cinematic demo of the FF movie sequence on GSCube(tm) by Sony, 45 seconds, one CG character. Character setup, Maya export, motion engine.

NCR/AT&T Company, USA, 1991 – 1994

- **R&D IN COMPUTER LINGUISTICS**
Developed a system for handling pronouns in natural language data inquiries, resolving of grammatically incomplete and terse questions, similar to ones used in everyday speech, evaluation of ambiguities and time-related information.
- **TCP/IP NETWORKING FOR ASKNCR(TM)**
askNCR(tm) is a distributed information processing system with a natural language user interface. Network support includes: text and voice messages, network phone services, teleconferencing, access of remote data, execution of remote code.

Institute of Telemetry, Academy Of Science, USSR, 1986 – 1991

- **X.25 NETWORKING**
Design, development and testing of software for packet-switching equipment. Frame-level libraries with error recovery for noisy/unstable network conditions.
- **ROM MONITOR FOR VME-BUS PC-SYSTEM**
Fully functional ROM-monitor program with inline assembler/deassembler for I-8086 instruction set, memory and register access, code execution with break points and jumps.

OTHER PROFESSIONAL ACTIVITIES

Reviewing for *ACM SIGGRAPH Annual Conference, 1999-2002, ACM Solid Modeling Conference, Spring Conference on Computer Graphics 2001, Shape Modeling International Conference 2001, The Visual Computer, IASTED Telehealth 2007 Conference,*

Member of ACM, IEEE.

Member of international program committee of
International Symposium on Cyber Worlds: Theory and Practice, Tokyo, Japan
the 3rd and the 4th *IASTED International Conference on Telehealth* in Banff Canada, Baltimore USA.

REFERENCES

Kaveh Kardan, Chief Technologist, Academy for Creative Media, University of Hawaii, kaveh@hawaii.edu
Marie-Paule Cani, Professor, INPG/iMAGIS, Grenoble, France. Marie-Paule.Cani@imag.fr
Jules Bloomenthal, President, Unchained Geometry, jules@unchainedgeometry.com
John Crossley, Professor, Monash University, Australia, John.Crossley@csse.monash.edu.au
Alexander Pasko, Professor, Hosei University, Tokyo, Japan. pasko@acm.org
Vladimir Savchenko, Professor, Hosei University, Tokyo, Japan. vsavchen@k.hosei.ac.jp

PERSONAL INFORMATION

Citizenship: Australia, Russia
Status in USA: Green card holder
Marital Status: Married

OTHER PUBLICATIONS

Alverson DC, Saiki SM Jr, Caudell TP, Summers K, Panaiotis, Sherstyuk A, Nickles D, Holten J, Goldsmith T, Stevens S, Kihmm K, Mennin S, Kalishman S, Mines J, Serna L, Mitchell S, Lindberg M, Jacobs J, Nakatsu C, Lozanoff S, Wax DS, Saland L, Norenberg J, Shuster G, Keep M, Baker R, Buchanan HS, Stewart R, Bowyer M, Liu A, Muniz G, Coulter R, Maris C, Wilks D., Distributed immersive virtual reality simulation development for medical education

Journal of International Association of Medical Science Educators Volume 15, Number 1, pages 19-30, 2005.

Panaiotis, Victor Vergara, Andrei Sherstyuk, Kathleen Kihmm, Stanley M. Saiki, Dale Alverson, Thomas P. Caudell, Algorithmically Generated Music Enhances VR Nephron Simulation

the 14th Annual Medicine Meets Virtual Reality Conference, Newport Beach, California, USA, January 24 - 27, 2006.

Dale C. Alverson, Stanley M. Saiki Jr., Thomas P. Caudell, Timothy Goldsmith, Susan Stevens, Linda Saland, Kathleen Colleran, John Brandt, Lee Danielson, Lisa Cerilli, Alexis Harris, Martin C. Gregory, Randall Stewart, Jeffrey Norenberg, George Schuster, Panaiotis, James Holten III, Victor M. Vergera, Andrei Sherstyuk, Kathleen Kihmm, Jack Lui, Kin Lik Wang, Reification of Abstract Concepts to Improve Comprehension Using Interactive Virtual Environments and a Knowledge-Based Design: A Renal Physiology Model

the 14th Annual Medicine Meets Virtual Reality Conference, Newport Beach, California, USA, January 24 - 27, 2006.

Stevens SM, Goldsmith TE, Summers KL, Sherstyuk A, Kihmm K, James R. Holten JR III, Davis C, Speitel D, Maris C, Stewart R, Wilks D, Saland L, Wax D, Panaiotis, Saiki S Jr, Alverson D and Caudell TP. Virtual Reality Training Improves Students Knowledge Structures of Medical Concepts. *the 13th Annual Medicine Meets Virtual Reality Conference*, IOS Press, Amsterdam, The Netherlands; 519-525, 2005.

D.C. Alverson, S.M. Saiki Jr, J. Jacobs, L. Saland, M.F. Keep, J. Norenberg, R. Baker, C. Nakatsu, S. Kalishman, M. Lindberg, D. Wax, M. Mowafi, K.L. Summers, J.R. Holten IV, J.A. Greenfield, E. Aalseth, A. Sherstyuk, D. Nickles, K. Haines, T.P. Caudell, Distributed Interactive Virtual Environments for Collaborative Experiential Learning and Training Independent of Distance over Internet2

the 12th Annual Medicine Meets Virtual Reality Conference, Newport Beach, California, USA, January 14 - 17, 2004.

M.Y. Mowafi, K.L. Summers, J. Holten, J.A. Greenfield, A. Sherstyuk, D. Nickles, E. Aalseth, W. Takamiya, S. Saiki, D. Alverson, T.P. Caudell, Distributed Interactive Virtual Environments for Collaborative Medical Education and Training: Design and Characterization

the 12th Annual Medicine Meets Virtual Reality Conference, Newport Beach, California, USA, January 14 - 17, 2004.

Andrei Sherstyuk, Fast ray tracing of implicit surfaces,

Third International Workshop on Implicit Surfaces (IS'98), Seattle, USA, June 15-16, 1998.

Conference posters

Andrei Sherstyuk, Dale Vincent, Caroline Jay, Sliding Viewport for Head Mounted Displays in Interactive Immersive Environments, *IEEE Symposium on 3D User Interfaces*, Reno, Nevada, USA, March 2008.

Christoph Aschwanden, Andrei Sherstyuk, Lawrence Burgess, Kevin Montgomery, A Surgical and Fine-Motor Skills Trainer for Everyone? Touch and Force-Feedback in a Virtual Reality Environment for

Surgical Training

the 14th Annual Medicine Meets Virtual Reality Conference, Newport Beach, California, USA, January 24 - 27, 2006.

Andrei Sherstyuk, Christoph Aschwanden, Stanley Saiki, Affordable Virtual Environments: Building a Virtual Beach for Clinical Use

the 13th Annual Medicine Meets Virtual Reality Conference, Newport Beach, California, USA, 2005.

Alverson DC, Saiki Jr SM, Caudell TP, Stevens S, Saland L, Colleran K, Brandt J, Danielson L, Cerilli L, Harris A, Gregory MC, Stewart R, Norenberg J, Shuster G, Panaiotis, Holten J III, Vergara VM, Sherstyuk A, Kihmm K, Lui J, Wang KL, Reification of Abstract Concepts to Improve Comprehension Using Interactive Virtual Environments and a Knowledge-Based Design

International Association of Medical Science Educators 9th Annual Meeting, Los Angeles, CA, July 2005

K. Kihmm, A. Sherstyuk, S. Saiki, D. Alverson, T. Caudell, 2D versus 3D in Virtual Reality, a Comparison
Human Computer Interface International, Las Vegas, July 2005.

K. Kihmm, A. Sherstyuk, K. Summers, T. Eyring, S. Smith, P. Weber, T. Caudell, The Flatland Architecture, An Open Source Visualization/Virtual Reality Development Environment

Computer Graphics (SIGGRAPH '04), Los Angeles, August 2004.

S. Saiki, C. Nakatsu, A. Sherstyuk, D. Nickles, K. Kihmm, J. Holten, T. Caudell, L. Saland, D. Wax, D. Alverson, Reification of Abstract Bio-Medical Concepts in Interactive Virtual Environments to Enhance Learning; a Renal Fly-Through Model

the 12th Annual Medicine Meets Virtual Reality Conference, Newport Beach, California, USA, January 14 - 17, 2004.