David H. Gotz
Research Staff Member
IBM T. J. Watson Research Center
19 Skyline Drive
Hawthorne, NY 10570
(914) 784-6364
Email: dgotz@us.ibm.com
WWW: http://www.gotzfamily.org/~dgotz/

CURRENT EMPLOYMENT

Research Staff Member
2006 - Present
T. J. Watson Research Center at IBM Research, Intelligent Multimedia Interaction Group

EDUCATION

University of North Carolina at Chapel Hill
- Ph.D. in Computer Science, 2005
- Dissertation Title: Scalable and Adaptive Streaming for Non-Linear Media
- M.S. in Computer Science, 2001

Georgia Institute of Technology
- B.S. in Computer Science, 1999, with Highest Honors
- Certificate for Minor in Economics

RESEARCH AREAS OF INTEREST

Computer Graphics
Computer Networking
Multimedia Computing
Visual Analytics
Visualization

PREVIOUS EMPLOYMENT

Post-Doctoral Research Scientist
2005 - 2006
T. J. Watson Research Center at IBM Research, Intelligent Multimedia Interaction Group

Research Assistant
2001 - 2005
UNC-Chapel Hill Computer Science Department, Multimedia Research

Research Intern
Summer 2001
Bell Labs, Multimedia Communications Research Lab

Research Assistant
1999 - 2001
UNC-Chapel Hill Computer Science Department, Office of the Future Group

Research Intern
Summer 1999
Naval Research Labs, Virtual Reality Lab

Research Intern
Summer 1998
Bell Labs, Multimedia Communications Research Lab

Undergraduate Research Assistant
1997 - 1999
Georgia Institute of Technology, Virtual Environments Group

Intern
Summers 1995, 1996, 1997
Bell Communications Research (Now part of SAIC)

REFEREED PUBLICATIONS

Ketan Mayer-Patel, David Gotz. Scalable and Adaptive Streaming for Non-Linear Media. *To Appear in IEEE Magazine*.

David Gotz. The ScratchPad: Sensemaking Support for the Web. *16th International World Wide Web Conference Posters* (2007), Banff, Canada.

David Gotz. Scalable and Adaptive Streaming for Non-Linear Media. *ACM Multimedia* (2006), Santa Barbara, CA.

David Gotz, Michelle X. Zhou, and Vikram Aggarwal. Interactive Visual Synthesis of Analytic Knowledge. *IEEE VAST* (2006), Baltimore, MD.

David Gotz, Michelle X. Zhou, Zhen Wen. A Study of Information Gathering and Result Processing in Intelligence Analysis. *IUI 2006 Workshop on Intelligent User Interfaces for Intelligence Analysis (2006)*. Sydney, Australia.

David Gotz, Ketan Mayer-Patel. A Framework for Scalable Delivery of Digitized Spaces. *International Journal on Digital Libraries (2005)*. 5(3).

David Gotz, Ketan Mayer-Patel. A General Framework for Multidimensional Adaptation. *ACM Multimedia* (2004). New York City, New York.

David Gotz. Supporting Adaptive Remote Access to Multiresolutional or Hierarchical Data for Large User Groups. *ACM Multimedia Doctoral Symposium* (2004). New York City, New York.

David Gotz, Ketan Mayer-Patel, Dinesh Manocha. IRW: An Incremental Representation for Image-Based Walkthroughs. *Proc. of ACM Multimedia* (2002). Juan-les-Pins, France.

Ruigang Yang, David Gotz, Justin Hensley, Herman Towles, Michael S. Brown. PixelFlex: A Reconfigurable Multi-Projector Display System. *Proc. of IEEE Visualization* (2001). San Diego, CA.

Jarrell Pair, Carlos Jensen, Jeff Wilson, Larry Hodges, David Gotz, Julian Flores. The NAVE: Design and Implementation of a Non-Expensive Immersive Virtual Environment. *Presented at SIGGRAPH Sketches and Applications* (2000).

Barbara Rothbaum, Larry Hodges, Renato Alacron, David Ready, Fran Shahar, Ken Graap, Jarrell Pair, Philip Hebert, David Gotz, Brian Wills, David Baltzell. Virtual Reality Exposure Therapy for PTSD Vietnam Veterans: A Case Study. *Journal of Traumatic Stress* (1999).

Larry Hodges, Barbara Rothbaum, Renato Alacron, David Ready, Fran Shahar, Ken Graap, Jarrell Pair, Philip Hebert, David Gotz, Brian Wills, David Baltzell. A Virtual Environment for the Treatment of Chronic Combat-Related Post-Traumatic Stress Disorder. *CyberPsychology & Behavior (Volume 2, Number 1, 1999*).

Larry Hodges, Barbara Rothbaum, Renato Alacron, David Ready, Fran Shahar, Ken Graap, Jarrell Pair, Philip Hebert, David Gotz, Brian Wills, David Baltzell. Virtual Vietnam: A Virtual Environment for the Treatment of Vietnam Veterans with Post-Traumatic Stress Disorder. *Proc. of the 8th International Conference on Artificial Reality & Tele-Existence (1998*). Tokyo, Japan.

TECHNICAL REPORTS

David Gotz and Ketan Mayer-Patel. GAL: A Middleware Library for Multidimensional Adaptation. *UNC-CS Technical Report TR05-023* (2005).

David Gotz and Ketan Mayer-Patel. Scalable and Adaptive Streaming for Non-Linear Media. *UNC-CS Technical Report TR05-022* (2005).

Brian Begnoche, David Gotz, Ketan Mayer-Patel. The Design and Implementation of StrandCast. *UNC-CS Technical Report TR05-004* (2005).

David Gotz. The Design and Implementation of Pixel Flex: A Reconfigurable Multi-Projector Display System. *UNC-CS Technical Report TR01-025* (2001).

TEACHING EXPERIENCE

University of North Carolina at Chapel Hill
COMP 14: Introduction to Programming

Georgia Institute of Technology
(Teaching Assistant) CS1501: Introduction to Computing

PROFESSIONAL SERVICE

Co-Chair, Poster Program Committee for the IEEE VAST, 2007
Member, Program Committee for the ACM Multimedia Conference, 2007
Member, Best Short Paper Award Committee for the ACM Multimedia Conference, 2006
Member, Program Committee for the ACM Multimedia Conference, 2006

Reviewer for ACM Multimedia, IEEE Information Visualization, IEEE MultiMedia Magazine, Eurographics, the IEEE International Conference of Pervasive Computing and Communications, and IEEE Transactions on Circuits and Systems for Video Technology.

Member of IEEE and ACM.

RESEARCH PROJECTS

Visual Analytics

Leading development of novel visual analytic techniques and tools. These tools, while generally applicable to a broad class of analytical tasks, are being designed as part of a prototype aimed at intelligence analysis and business intelligence.

Intelligent Multimedia Interaction

Contributed to the development of a context-aware multi-modal conversation system for information-seeking applications. My primary contributions on this project focused on automated layout algorithms for graphical presentation.

Scalable and Adaptive Streaming for Non-Linear Media

Developed a general framework for scalable and adaptive streaming of non-linear media datasets to large user populations. The framework specifies representation, communication, and adaptation mechanisms to solve a general class of remote access problems.

StrandCast

Designed, with collaborators, a new application-layer multicast protocol for single-source latency-invariant applications. For this broad class of applications, StrandCast provides a number of desirable performance properties and is designed to achieve scalable performance for large user groups.

SWIM: Streaming Walkthroughs of Image-based Models

Designed a system for streaming image-based models to both small user groups (via unicast) and large user groups (via broadcast). The streaming framework enables access to digitized spaces from both clients with heterogeneous network resources. The system was tested in a variety of network environments, ranging from consumer level cable modem connections to high-speed corporate LANs. Evaluation was performed via network emulation.

IRW: An Incremental Representation for Image-based Walkthroughs

Created a new representation for interactive image-based walkthroughs. The target applications reconstruct a scene from novel viewpoints using samples from a spatial image dataset collected from a plane at eye-level. The datasets pair images with camera pose information and are often extremely large in size. The IRW representation exploits spatial coherence and rearranges the input samples as epipolar images. The base unit corresponds to a column of the original image that can be individually addressed and accessed. IRW supports incremental updates, efficient encoding, scalable performance, and selective inclusion used by different reconstruction algorithms.

PixelFlex

Designed and developed, as part of a team, a spatially reconfigurable multi-projector display system capable of rendering high-resolution, seamless imagery upon irregular display surfaces. The PixelFlex system is composed of ceiling-mounted projectors, each with computer-controlled pan, tilt, zoom and focus, and a camera for closed-loop calibration. Working collectively, these controllable projectors function as a single logical display. The flexible projector/camera arrangement allowed for high resolution inserts and automatic calibration.

The NAVE

Designed and built, as part of a team, an immersive three-projector stereo display system for virtual environments. The NAVE consists of three passive stereo rear-projection screens arranged in a half-hexagon formation. Surround sound and tactile feedback devices were also incorporated to stimulate multiple senses simultaneously.

Pyramidic Panels:

Developed highly-articulated pyramidic panels, extending their use to more intricate images with complex disparity properties. Extended pyramidic panels with a novel hidden surface removal algorithm based on BSP trees.

Virtual Reality Exposure Therapy:

Developed, as part of a team, a virtual environment system to treat Vietnam War veterans who suffer from Post Traumatic Stress Disorder (PTSD). The system used a head mounted display, 3D sound, a tactile-feedback chair, a magnetic tracker and commodity PC hardware. Evaluation was performed in cooperation with real patients through the Emory VA Hospital in Georgia. This technology is now available as a commercial product via Virtually Better (www.virtuallybetter.com).

REFERENCES

Provided upon request.