

Joseph T. Kider Jr.

Center for Human Modeling and Simulation
Dept of Computer & Information Science
University of Pennsylvania
Philadelphia, PA 19104-6389

E-mail kiderj@seas.upenn.edu
Home: (215) 833-5677
Work: 215-573-9463
Web: <http://www.seas.upenn.edu/~kiderj/>

Education

Doctor of Philosophy, Computer and Information Science, University of Pennsylvania, Philadelphia, PA
Primary Fields: Computer Graphics
Advisor: Norman I. Badler
Expected...

Master of Science in Engineering, Computer and Information Science, University of Pennsylvania, Philadelphia, PA
Completion Date: December 2004

Bachelor of Science in Computer Science, Electrical Engineering and Computer Sciences, The Catholic University of America, Washington, D.C.
Minors: Mathematics and Politics
Completion Date: May 2003

Research Interests

My current research interests are in computer graphics and computer animation. In, particular, they include simulating physically based time-varying surface and geometry imperfections, computer animation and multi-modal motion capture, and GPU programming / architecture.

Research Experience

Simulating Time-Varying Imperfections in Realistic Virtual Environments: This system is a series of procedural techniques and tools for automatically creating imperfections in virtual environments. The automatically or artistically blemishes and ages a given environment. We have demonstrated this result on aging fruit and texturing an outdoor scene.

Multi-modal Motion Capture: This project will collect a unique database of synchronized inputs: motion capture, force plate, muscle responses, video, eye tracking, biometric sensors, audio, and sole pressure sensors. The goal is to provide a novel data-driven technique for character animation to appear more natural. Current projects entail a data-driven model of human exhaustion and realistic idling behaviors.

GPU Programming: This work utilizes the architecture and capabilities of modern GPUs. The GPU is a massively multi-core processor utilized in research to increase performance of simulations for real-time performance of a variety of path planning algorithms (such as R*GPU), useful for high dimensional planning problems.

Virtual Archaeology: gathered experimental archaeological data and investigated and validated how various water levels and glass fixture shapes, likely used during early Islamic times, changed the overall light patterns and downward caustics. We applied results to Mosque of Córdoba to get a more perceptually valid and physically accurate lighting model.

Untethered Motion Capture Evaluation for Flightline Maintenance: The purpose of this effort is to explore and evaluate the utility of novel motion capture technologies within the Air Force maintenance domain. Here we used machine learning techniques to build a prototype system to classify and recognize various maintenance activities.

AVIS-MS: Advanced Visual and Instruction Systems for Maintenance Support: This project investigates technologies that maybe used in the maintenance of Air Force equipment. Here we used virtual reality and motion capture to help display technical instructions to maintainers.

Indirect Motion Capture: Head Tracker: In this project we attempted a first step in an indirect motion capture system. The system measures the head location from motion capture data and tracks the output on screen where the subject is looking in real-time.

Virtual Checkpoint: This project implemented real time gesture recognition of a motion capture subject which controlled a virtual character. The virtual environment interacted with the characters gestures in real time. The system was robust for a wide range of motion capture subjects (I am rather tall) and demoed at the (I/ITSEC) conference.

Professional Work Experience

1/2011 - Present University of Pennsylvania Philadelphia, PA
Lecturer , Computer and Information Science Department, University of Pennsylvania

7/2009 – Present University of Pennsylvania Philadelphia, PA
Associate Director, SIG Center for Computer Graphics, Human Modeling and Simulation Laboratory (HMS)

1/2002 – 8/2003 Naval Research Laboratory Washington, D.C.
Software Development Internship

Summer 2001, 2002 Naval Surface Warfare Center Philadelphia, PA
Software Intern

9/1999 – 1/2002 The Catholic University of America Washington DC
Web Developer

Selected Publications

Full-Length Publications:

J. Kider, K. Pollock, A. Safonova, "A Data-driven Appearance Model for Human Fatigue", Symposium for Computer Animation, 2011 (**Honorable Mention Paper Award**)

J. Kider, S. Raja, N. Badler, "Fruit Senescence and Decay Simulation", Computer Graphics Forum (Proceedings of Eurographics), 2011

D. Markowitz, J. Kider, A. Shoulson, and N. Badler, "Intelligent Camera Control using Behavior Trees", Motion in Games, 2011

J. Kider, M. Henderson, M. Likhachev, and A. Safonova, "High-dimensional Planning on the GPU", IEEE International Conference on Robotics and Automation, 2010

J. Kider, R. Fletcher, N.Yu, R.Holod, A.Chalmers, N.I.Badler, "Recreating Early Islamic Glass Lamp Lighting", 10th VAST International Symposium on Virtual Reality, Archaeology and Cultural Heritage, 2009 (**Best Paper Award**)

G. Katz, and J. Kider. "All-Pairs Shortest-Paths for Large Graphs on the GPU", Graphics Hardware, Sarajevo, Bosnia-Herzegovina, 2008.

J.Kider, C.Stocker, and N.Badler, "Untethered Motion Capture Evaluation for Flightline Maintenance", Technical Report, US Airforce, Dayton, Ohio, 2008

Short-length Publications:

M. Henderson, J.Kider, M. Likhachev, and A. Safonova, "High-dimensional Planning on the GPU", GPU Technology Conference, 2009 (**Best Poster Award**)

Teaching Experience

Fall 2011 <i>Instructor</i>	University of Pennsylvania	Philadelphia, PA
Instructor for GPU Programming and Architecture (CIS 565/665).		
Spring 2011 <i>Instructor</i>	University of Pennsylvania	Philadelphia, PA
Instructor for Physically Based Animation (CIS 563).		
Spring 2011 <i>Co-Instructor (with Dr. Norman I. Badler)</i>	University of Pennsylvania	Philadelphia, PA
Co-Instructor for Senior Capstone Project –Digital Media Design (EAS 499/CIS497).		
Spring 2010 <i>Instructor</i>	University of Pennsylvania	Philadelphia, PA
Instructor for GPU Programming and Architecture (CIS 565/665).		
Spring 2010 <i>Co-Instructor (with Dr. Norman I. Badler)</i>	University of Pennsylvania	Philadelphia, PA
Co-Instructor for Senior Capstone Project –Digital Media Design (EAS 499/CIS497).		
Summer 2009 <i>Instructor</i>	University of Pennsylvania	Philadelphia, PA
Instructor for GPU Programming and Architecture (CIS 565/665).		
Spring 2009 <i>Co-Instructor (with Dr. Norman I. Badler)</i>	University of Pennsylvania	Philadelphia, PA
Co-Instructor for Senior Capstone Project –Digital Media Design (EAS 499/CIS497).		
Spring 2008	University of Pennsylvania	Philadelphia, PA

Co-Instructor (with Gary Katz)

Co-Instructor for GPU Programming and Architecture (CIS 565/665).

Spring 2007

University of Pennsylvania

Philadelphia, PA

Graduate Teaching Assistant (with Gary Katz)

Served as a teaching assistant for GPU Programming and Architecture (CIS 565/665).

Fall 2005

University of Pennsylvania

Philadelphia, PA

Graduate Teaching Assistant (with Dr. Stephen Lane)

Served as a teaching assistant for Computer Animation (CIS 462/562).

Awards

- Honorable Mention Paper Award: ACM/Eurographics Symposium on Computer Animation 2011
- Penn Prize for Excellence in Graduate Student Teaching 2010
- Best Paper Award, 10th VAST International Symposium on Virtual Reality, Archaeology and Cultural Heritage 2009
- Best Poster Award, 1st GPU Technology Conference 2009

Technical Skills

- **Motion Capture Systems:** Vicon MX, Ascension ReActor, Immersion CyberGloves, Animazoo Gypsy Gro, Innalabs 3D Suit, Xsens Moven, Natural Point OptiTrack
- **Multi- Modal Systems:** Medilogic Sole Pressure Senors, FlexComp Biometric Sensors (EKG, GSR, Respiration, Tempeture, BVP), AMTI Force Plates, Basker Digital Cameras
- **Languages:** C++, C, Matlab, Python, GLSL, CG, CUDA, OpenCL, PHP, (Limited) Ada, RSL
- **Libraries:** OpenGL, OpenCL, GLUT, QT, SOIL
- **Tools:** Maya, VC++, Vicon (Nexus, Blade, Bodybuilder), Photoshop

References

- **Dr. Normal Badler** (badler at seas.upenn.edu)
Director, Center for Human Modeling and Simulation; Professor, Computer and Information Science, University of Pennsylvania
- **Amy Calhoun** (cal1 at seas.upenn.edu)
Associate Director of Digital Media Design; University of Pennsylvania
- **Dr. Alla Safonova** (alla at cis.upenn.edu)
Assistant Professor, Computer & Information Science Dept. University of Pennsylvania.
- **Dr. Stephen Lane** (slane at cis.upenn.edu)
Adjunct Professor, Computer & Information Science Dept. University of Pennsylvania.