

Joseph T. Kider Jr.

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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 creating physically based simulations such as time-varying surface and geometric imperfections, multi-modal motion capture and character animation, and GPU programming and 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. They automatically or artistically blemishes and age a given environment. We have demonstrated this technique on aging fruit and texturing outdoor scenes.

Simulation of Fruit Senescence and Decay: This technique simulates interactions between multiple aging and decaying processes in fruit. Our biologically derived reaction-diffusion model generates growth patterns for areas of fungal and bacterial infection. This process changes the physical properties of the surface and internal volume substrate. We provide a tool that allows the simulation to be both physically accurate, and allows an artist to customize the desired output in a Maya plug-in.

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

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 University of Pennsylvania Philadelphia, PA
Instructor
Instructor for GPU Programming and Architecture (CIS 565/665).

Spring 2011 University of Pennsylvania Philadelphia, PA
Instructor
Instructor for Physically Based Animation (CIS 563).

Spring 2011 University of Pennsylvania Philadelphia, PA
Co-Instructor (with Dr. Norman I. Badler)
Co-Instructor for Senior Capstone Project –Digital Media Design (EAS 499/CIS497).

Spring 2010 University of Pennsylvania Philadelphia, PA
Instructor
Instructor for GPU Programming and Architecture (CIS 565/665).

Spring 2010 University of Pennsylvania Philadelphia, PA
Co-Instructor (with Dr. Norman I. Badler)
Co-Instructor for Senior Capstone Project –Digital Media Design (EAS 499/CIS497).

Summer 2009 University of Pennsylvania Philadelphia, PA
Instructor
Instructor for GPU Programming and Architecture (CIS 565/665).

Spring 2009 University of Pennsylvania Philadelphia, PA
Co-Instructor (with Dr. Norman I. Badler)
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.