Lucas Kovar

316 N. Few St., Apt. 1
Madison, WI 53703
608-265-2711
kovar@cs.wisc.edu
www.cs.wisc.edu/∼kovar

RESEARCH INTERESTS

My research focus is computer graphics, although my interests extend to related fields such as computer vision and robotics. My dissertation research investigated using motion capture data to build generative models of visually realistic human motion. These models allow a user to create sophisticated animations simply by providing high-level requirements for a character, e.g., "walk up to this box and lift it". The primary contribution of my thesis is the development of *automated* methods for building data-driven motion models from large data sets. This is important because the range of motion that can be produced from a data-driven model is limited by the amount of input data, and so flexible models require both large data sets and automated tools that make working with these data sets feasible. Specific results of my thesis work include:

- A method for automatically converting a raw motion data set into a graph structure that can seamlessly attach short motions into lengthy, complex animations.
- A fully automatic algorithm for blending captured motions, which can be used to transition between motions, interpolate motions, or exert continuous control over a motion.
- Automated tools for building "parameterized" motions that can be controlled through high-level features. For example, a parameterized punch might allow an animator to create a specific punch just by specifying a target location.

EDUCATION

- **Ph.D. Computer Science**, November 2004
  University of Wisconsin, Madison
  Dissertation Title: *Automated Methods for Data-Driven Synthesis of Controllable and Realistic Human Motion*
  Advisor: Michael Gleicher
- **M.S. Computer Science**, May 2001
  University of Wisconsin, Madison.
- **B.S. Physics**, June 1999
  Stanford University

WORK EXPERIENCE

- **Graduate Student Researcher**, June 2000 – current
  University of Wisconsin, Madison, WI, USA
  Developed and implemented several novel techniques for editing and synthesizing human motion. In the course of this work I have built a standalone system for working with motion capture data, and I have practical experience in all stages of the motion pipeline from processing raw marker data to animating character meshes.

- **Research Intern**, May 2002 – August 2002
  Institute for Creative Technologies, Marina Del Rey, CA, USA
  Developed and implemented a general technique for synthesizing arbitrarily long motions that satisfy user-specified constraints.
- **Teaching Assistant**, September 1999 – May 2000
  University of Wisconsin, Madison, WI, USA
  Taught lab sections in an introductory computing course. Designed and graded assignments.
- **Research Assistant/Programmer**, June 1998 – August 2000
  Signition, Inc., Los Alamos, NM, USA
  Helped develop novel algorithms for noise reduction and signal detection at a small signal processing company.
- **Research Assistant**, June 1997 – August 1997
  Stanford University, Stanford, CA, USA
  Collected and analyzed photometric data as part of a project to locate black holes.
- **Tutor**, October 1996 – May 1998
  Stanford University, Stanford, CA, USA
  Tutored undergraduates in physics and math.

REFEREED PUBLICATIONS

Please visit http://www.cs.wisc.edu/∼kovar/projects.html for links to papers and videos

SIG '04 Lucas Kovar and Michael Gleicher. *Automated Extraction and Parameterization of Motions in Large Data Sets.* ACM Transactions on Graphics, 23(3) (ACM SIGGRAPH '04), August 2004.

PG'03 Hyun Joon Shin, Lucas Kovar, and Michael Gleicher. *Physical Touchup of Human Motions.* Pacific Graphics, October 2003.

SCA'03 Lucas Kovar and Michael Gleicher. *Flexible Automatic Motion Blending with Registration Curves.* ACM SIGGRAPH Symposium on Computer Animation, July 2003.

I3D'03 Michael Gleicher, Hyun-Joon Shin, Lucas Kovar, and Andrew Jepsen. *Snap-Together Motion: Assembling Run-Time Animations.* ACM SIGGRAPH Symposium on Interactive 3D Graphics, April 2003.

SIG'02 Lucas Kovar, Michael Gleicher, and Fred Pighin. *Motion Graphs*. ACM Transactions on Graphics, 21(3) (ACM SIGGRAPH '02), July 2002. (Proceedings of SIGGRAPH 2002)

SCA'02 Lucas Kovar, John Schreiner, and Michael Gleicher. *Footskate Cleanup for Motion Capture Editing.* ACM SIGGRAPH Symposium on Computer Animation, July 2002.

UIST'01 Lucas Kovar and Michael Gleicher. *Simplicial Families of Drawings*. Proceedings of User Interface Software Technology, November 2001.

HONORS

- Cisco Fellow, 2003 – 2004.
- Intel Fellow, 2002 – 2003.

- UW-Madison CS Department Summer Research Fellowship, 2000.

PROFESSIONAL ACTIVITIES

- Paper reviewer for SIGGRAPH 2003–2004, SCA 2003–2004, GI 2004, EG 2004, GM 2004, NPAR 2004, TPAMI 2004, TVCG 2004, TOG 2003, EGWR 2002, and JVCA 2002.

PERSONAL INFORMATION

- U.S. Citizen
- Born 9/16/78
- Martial arts experience includes tae kwon do (1.5 years), aiki-jujitsu (4 years), aiki jo and bokken (4 years), and capoeira (4.5 years). Moderate backgrounds in Brazilian jujitsu and Thai boxing.

REFERENCES

Prof. Michael L. Gleicher
Associate Professor
Dept. of Computer Science
University of Wisconsin, Madison
1210 W. Dayton St.
Madison, WI 53706-1685 USA
Telephone: (608) 263-2874
Fax: (608) 262-9777
Email: gleicher@cs.wisc.edu

Prof. Norman I. Badler
Professor
Office of Academic Programs, Towne Building 111
School of Engineering and Applied Science
University of Pennsylvania
220 South 33rd Street
Philadelphia, PA 19104-6391 USA
Telephone: (215) 898-7246
Fax: (215) 573-5577
Email: badler@seas.upenn.edu

Prof. Charles R. Dyer
Professor
Dept. of Computer Science and
Dept. of Biostatistics and Medical Informatics
University of Wisconsin, Madison
1210 W. Dayton St.
Madison, WI 53706-1685 USA
Telephone: (608) 262-1965
Fax: (608) 262-9777
Email: dyer@cs.wisc.edu

Dr. Paul Debevec
Executive Producer, Graphics Research
USC Institute for Creative Technologies
13274 Fiji Way, 5th floor
Marina del Rey, CA 90292 USA
Telephone: (310) 574-7809
Email: paul@debevec.org

Prof. Stephen Chenney
Assistant Professor
Dept. of Computer Science
University of Wisconsin, Madison
1210 W. Dayton St.
Madison, WI 53706-1685 USA
Telephone: (608) 262-5083
Fax: (608) 262-9777
Email: schenney@cs.wisc.edu