

Kelly A. Ward

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OBJECTIVE

To obtain a research and development/software production position for simulation effects in feature film, television, and/or commercial production

EDUCATION

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, Chapel Hill, NC

Ph.D. Candidate in Computer Science SUMMER 2005 (Expected)

Dissertation Topic: **Modeling Hair using Levels-of-Detail**

Advisor: Prof. Ming C. Lin

Dissertation Committee Members: Dinesh Manocha, Gary Bishop, Anselmo Lastra, and Mark Foskey

Master of Science in Computer Science MAY 2002

Area of Study: Computer Graphics – Physically-Based Modeling and Simulation

TRINITY COLLEGE, Hartford, CT MAY 2000

Bachelor of Science with honors in Computer Science and honors in Physics

Honors:

- Phi Beta Kappa – Trinity College Chapter, inducted in 2000;
- Traveler's Computer Science Senior Research Award – for best senior project in computer science 2000;
- President's Fellow in Physics (highest GPA in major) 1999-2000;
- Faculty Honors

WORK EXPERIENCE

RESEARCH ASSISTANT, GAMMA Group, University of North Carolina, MAY 2001 – PRESENT

Lead researcher on hair simulation, collision detection, rendering, and interactive styling using geometric and simulation levels-of-detail (LODs); Project website: <http://www.cs.unc.edu/~wardk/research.html>

RHYTHM AND HUES, Los Angeles, CA SUMMER 2003

Software Applications Intern

Researched and co-designed in-house graphics hardware renderer; Wrote fragment and vertex programs for fast viewing of feature film and commercial production effects.

INTEL CORPORATION, Hillsboro, OR SUMMER 2002

Technical Marketing Engineer Intern

Worked on physically-based animation of hair along with optimizations that involved specific Intel Pentium architecture specifications.

COMPUTER RESEARCH ASSOCIATION DISTRIBUTED MENTOR PROJECT

Research Assistant: Brooklyn College, Brooklyn, NY SUMMER 1999

Work involved Monte Carlo calculations for performing integrals

Research Assistant: George Mason University, Fairfax, VA SUMMER 1998

Work involved writing a visualization tool for LR parsing in Java

REFEREED PUBLICATIONS

- Kelly Ward, Nico Galoppo, and Ming C. Lin. Modeling Hair Influenced by Water and Styling Products. *Proceedings of Computer Animation and Social Agents (CASA)*, pp. 207-214, 2004.
- Kelly Ward, Nico Galoppo, and Ming C. Lin. Simulating and Rendering Wet Hair. *ACM SIGGRAPH Sketches and Applications*, 2004.
- Kelly Ward and Ming C. Lin. Adaptive Grouping and Subdivision for Simulating Hair Dynamics. *In Pacific Graphics Conference on Computer Graphics and Applications*, pp.234-243, 2003.
- Kelly Ward, Ming C. Lin, Joohee Lee, Susan Fisher, and Dean Macri. Modeling Hair Using Level-of-Detail Representations. *Proceedings of Computer Animation and Social Agents (CASA)*, pp. 41-47, 2003.

TECHNICAL REPORTS

- Kelly Ward, Susan Fisher, and Ming C. Lin. Simplified Representations for Modeling Hair. UNC Technical Report #TR02-020, 2002.

INVITED TALK

Hair Simulation Using Levels-of-Detail. Academia and Interactive Multimedia Event 2003, hosted by SONY Computer Entertainment America, San Diego. August 1, 2003.

TEACHING EXPERIENCE

INSTRUCTOR, University of North Carolina FALL 2004

Class: COMP 14 – Introduction to Programming

Responsible for grading, lecturing, student help and all class material including lecture notes, exams, quizzes, homeworks, labs, programming assignments

TEACHING ASSISTANT, University of North Carolina FALL 2000 - SPRING 2001

Classes: Introduction to Scientific Computing, Data Structures

TEACHING ASSISTANT, Trinity College, Hartford, CT FALL 1997 - FALL 1998

Classes: Introduction to Computer Science, Data Structures and Algorithms, Electricity and Magnetism, Mechanics and Heat, Stars and Galaxies

COURSE PROJECTS

Collision Detection for Hair Simulation using Swept Sphere Volumes

Created framework consisting of a family of swept sphere volumes for detecting collisions between hair and a head or body as well as collisions among hair. Framework allows for interactive simulation of hair.

Shader for Fur using NVIDIA's Cg

Wrote a vertex program and a fragment program for creating furry surfaces using shells offset from an object.

Dynamic NURBS for String Motion Animation

Dynamic NURBS are used to model all types of string motion. This includes applying forces to any point along the string and using physical laws of motion to control the resulting behavior of the string.

Software-Based OpenGL Renderer

Created graphics engine and software rendering pipeline based on the OpenGL architecture. Features included homogeneous clipping, rasterization, smooth shading, and lighting.

Using Dynamic NURBS for Physics-Based Wave Motion Modeling

Used Dynamic NURBS to accurately simulate the motion of waves propagating along a string with two fixed endpoints. Used physics laws and equations to model wave properties, such as constructive and destructive interference.

RELEVANT COURSES

Computer Graphics	Physically-Based Modeling, Simulation and Animation
Motion Planning and Synthesis	Scientific and Geometric Computation
Geometric and Solid Modeling	Computational Geometry
Advanced Image Generation	Geometry of Curves and Surfaces
Images, Graphics, and Vision	Software Design and Implementation

COMPUTER SKILLS

Languages: C/C++, OpenGL, NVIDIA's Cg, Java, Assembly, HTML

Operating Systems/Hardware: Windows Operating Systems, UNIX, MacOS, Linux

Software: Intel VTune Performance Analyzer, Adobe Photoshop and Premiere, 3D Studio Max, Matlab, Emacs, JDK

ACTIVITIES AND HOBBIES

Drawing, needlework, decoupage, playing the piano, jogging, Student ACM Vice-President (Trinity College)

REFERENCES

Available Upon Request