

A Class on Realistic Hair Simulation – animation and rendering

Submission Format & Area

Class - SIGGRAPH Core

Submission Categories

Research
Animation & Visual Effects

Proposed Length

Double session (3.75 hours)



Summary

The last five years have seen a profusion of innovative solutions to one of the most challenging tasks in character synthesis: hair simulation. This class covers both recent and novel research ideas in hair animation and rendering, and presents time tested industrial practices that resulted in spectacular imagery.

Target and contents

The class addresses the special-effects developers and technical directors who are looking for innovation as well as proven methodologies in hair simulation. The audience will get a good grasp of the state of the art in hair simulation and will have plenty of working solutions that they can readily implement in their production pipelines. The class will also be a boot-camp for aspiring computer graphics researchers interested in physically based modeling.

The class covers two crucial tasks in hair simulation: animation and rendering. For hair animation, we first discuss recent successful models for simulating the dynamics of individual hair strands, before presenting viable solutions for complex hair-hair and hair-body interactions. For rendering, we address issues related to shading models, multiple scattering, and volumetric shadows. We finally demonstrate how hair simulation techniques are nowadays developed and applied in the feature films industry to produce outstanding visual effects.

Organization

This class is structured in four main sessions: 1)Simulation of individual strands, 2)Hair interactions, 3)Hair rendering and 4)Hair simulation in features productions. Each one of this parts reviews the corresponding challenges and gives working solutions. **A syllabus giving a detailed schedule and contents of the class has been uploaded as a supplementary supporting document to this class submission.**

Class History

This class has been given at SIGGRAPH 2007 as a full day course, and had great success due to the completeness of the talks and the diversity of the lecturers, coming both from academics and production - all of them being well-recognized specialists in the field of hair simulation. This 2007 course was also awarded the “best course notes prize for a new course”. Given the increasing interest for hair simulation in research and feature production, we are submitting an up-to-date 2008 half-day class which, compared to last year's course, will specifically focus on high realism in hair animation and rendering, and will present the latest physically-based approaches for generating outstanding hair simulations. In addition, spectacular simulation techniques from the latest feature films, such as *Pirates of the Caribbean*, *Shrek The Third*, *The Night at the Museum*, *Bolt* (to be released), and others, will be covered.

Bibliography and links

[A Survey on Hair Modeling: Styling, Simulation, and Rendering](#), K. Ward, F. Bertails, T.-Y. Kim, S. Marschner, M.-P. Cani, M. Lin. TVCG March/April 2007.

Submission URL: <http://www.inrialpes.fr/bipop/people/bertails/CoursSiggraph2008/courseProp2008.html>