

Series Editors

W. Hansmann

W. Purgathofer

F. Sillion

N. Magnenat-Thalmann
D. Thalmann
B. Arnaldi (eds.)

Computer Animation and Simulation 2000

Proceedings of the Eurographics Workshop in Interlaken, Switzerland,

August 21 – 22, 2000

Eurographics

Springer-Verlag Wien GmbH

Prof. Dr. Nadia Magnenat-Thalmann MIRA Lab, University of Geneva, Geneva. Switzerland

Dr. Daniel Thalmann Computer Graphics Laboratory, Swiss Federal Institute of Technology, Lausanne, Switzerland

Dr. Bruno Arnaldi
Institut de Recherche an Informatique
et Systèmes Aléatoires, Rennes,
France

This work is subject to copyright.

All rights are reserved, whether the whole or part of the material is concerned, specifically those of translation, reprinting, re-use of illustrations, broadcasting, reproduction by photocopying machines or similar means, and storage in data banks.

© 2000 Springer-Verlag Wien Originally published by Springer-Verlag Wien New York in 2000

Typesetting: Camera-ready by authors

Graphic design: Ecke Bonk

Printed on acid-free and chlorine-free bleached paper

SPIN: 10778566

With 110 partly coloured Figures

ISSN 0946-2767

Preface

This volume contains the research papers presented at the Eleventh Eurographics Workshop on Computer Animation and Simulation which took place in Interlaken, Switzerland, August 21-22, 2000. The workshop is an international forum for research in human animation, physically-based modeling, motion control, animation systems, and other key aspects of animation and simulation.

The call for papers required submission of the full papers for review, and each paper was reviewed by at least 3 members of the international program committee and additional reviewers. Based on the reviews, 14 papers were accepted and the authors were invited to submit a final version for the workshop.

We wish to especially thank all reviewers for their time and effort in working within the rigid constraints of the tight schedule, thereby making it possible to publish this volume in time for the workshop. We also thank the authors for their contributions to the workshop, without whom this unique forum for animation and simulation work would not exist.

We are grateful to the Eurographics Association and especially to Werner Purgathofer from the Technical University of Vienna, for his support in publishing the workshop as a volume of the Springer-Verlag Eurographics Series. We also thank the Eurographics '2000 organisers, especially David Duce, and Heinrich Müller from the EG board. We are also very grateful to Zerrin Celebi for the organization of the review process and and Josiane Bottarelli for the registration process.

Nadia Magnenat-Thalmann
Daniel Thalmann
Bruno Arnaldi (Co-Chairs)

Program Committee

Nadia Magnenat-Thalmann (University of Geneva, Switzerland)
Daniel Thalmann (EPFL, Switzerland)
Bruno Arnaldi (IRISA/INRIA Rennes, France)

Norm Badler (University of Pennsylvania, USA)
Ronan Boulic (EPFL, Switzerland)
Marie-Paule Cani (IMAG, France)
Michael Cohen (Microsoft, USA)
Sabine Coquillard (INRIA, France)
James Hahn (Georges Washington University)
Gerard Hegron (Ecole des Mines de Nantes, France)
Jessica Hodgins (Georgia Institute of Technology, USA)
Prem Kalra (Indian Institute of Technology, Delhi, India)
Heedong Ko (Korea Institute of Science and Technology)
Hansrudi Noser (University of Zurich, Switzerland)
Igor Pandzic (University of Geneva, Switzerland)
Werner Purgathofer (Technical University of Wien, Austria)
Ming Ouhyoung (National Taiwan University)
Frank van Reeth (Limburgs University Center, Belgium)

Reviewers

Amaury Aubel (EPFL, Switzerland)
Gilles Debunne (IMAG, France)
Sunil Hadap (University of Geneva, Switzerland)
Marcelo Kallmann (EPFL, Switzerland)
Laurent Maccozet (University of Geneva, Switzerland)
James Stewart (IMAG, France)
Alexander Wilkie (Technical University of Wien, Austria)
Michael Wimmer (Technical University of Wien, Austria)

Pascal Volino (University of Geneva, Switzerland)

Contents

1. Facial Animation and Ageing
A Parametric Tongue Model for Animated Speech
Simulation of Skin Aging and Wrinkles with Cosmetics Insight 15 Laurence Boissieux, Gergo Kiss, Nadia Magnenat Thalmann and Prem Kalra
A Low Bit-rate Web-enabled Synthetic Head with Speech-driven Facial Animation
2. Character Animation
A Grasp-based Motion Planning Algorithm for Character Animation
Motion Tracking with Dynamic Simulation
ACE: A Platform for the Real Time Simulation of Virtual Human Agents
3. Hair Modelling
Interactive Hair Styler based on Fluid Flow
Real-Time Animation of Human Hair Modeled in Strip

4. Deformable Models

Controlling Anisotropy in Mass-Spring Systems
Realistic Deformation of Human Body Shapes
Implicit-Explicit Schemes for Fast Animation with Particle Systems 137 Bernhard Eberhardt, Olaf Etzmuß and Michael Hauth
5. Modelling and Simulation
An Accurate Model of Wave Refraction Over Shallow Water 155 Manuel N. Gamito and F. Kenton Musgrave
Animation and Simulation Techniques for VR-Training
Using Cartesian Product for Animation
Appendix: Colour Illustrations