4

11:15–11:45

Three-Dimensional Modeling and Effects on Still Images

Yaron Zakai
The Hebrew University of Jerusalem

Creative artists and designers use computer graphics and image processing effects on still photographs in application areas such as advertising, entertainment, broadcasting and the arts. Most of the effects available in research work and commercial products are two-dimensional in nature, for example image processing filters (blur, edge enhancement) and creative effects (tilings, reflections). There is almost no usage of information taken from the 3D world in which the objects depicted in the image are located.

The speaker will present a novel method for creating 3D effects on photographs, or in general on any image created by rendering a 3D world. The artist interacts with the image using a set of intuitive direct manipulation interface objects. These objects let the user define a 3D model, display it and manipulate it in a 3D space which is correlated with that of the input image.

The generated model can be an arbitrarily complex 3D polyhedron. Any texture, including texture taken from the input photograph, can be mapped into any of its faces and used for special effects. The speaker will discuss effects such as copy and paste, motion blur, model editing and deformations, and lighting effects.

Joint work with Ari Rappoport.

5

11:45–12:15

Temporal Continuity of Levels of Detail in Delaunay Triangulated Terrain

Yishay Levanoni
Tel-Aviv University

The representation of a scene at different levels of detail is necessary to achieve real-time rendering. In aerial views only the part of the scene that is close to the viewing point needs to be displayed at a high level of detail, while more distant parts can be displayed at a low level of detail. However, when the sequence of images is generated and displayed in real time, the transition between different levels of detail causes noticeable temporal aliasing.

The speaker will propose a method, based on object blending, that visually softens the transition between two levels of Delaunay triangulation. He will present an algorithm that establishes, in an off-line process, a correspondence between two given polygonal objects. The correspondence enables on-line blending between two representations of an object, so that one representation (level of detail) progressively evolves into the other.

6

12:15–12:45

The Latest Graphics Solutions from Sun Microsystems

John Slater
Sun Microsystems, U.K.

INVITATION

ISRAEL SIGGRAPH PROFESSIONAL CHAPTER MEETING

Sponsored by

Silicon Graphics (Israel) Ltd.

8:30–12:45
June 28, 1996
Lev Hall (near Shenkar Bldg.)
Tel-Aviv University

Chairman: Ari Rappoport
The Hebrew University of Jerusalem

This invitation is an entry permit for your car at gate 4 of the Tel-Aviv University campus.

8:30–9:00
Refreshments

$\boxed{1}$

9:00–9:30
Behavior and Collaborative Work in Dynamic Virtual Environments

Haim Levkowitz
University of Massachusetts Lowell

The speaker will describe his ongoing work (jointly with Jose Annunziato and Fredy Jara) on the development of collaborative work in dynamic virtual reality environments, where a number of remote users can interact with each other and with the virtual environment. The speaker will discuss several types of behavior, and explore methods of generalizing their description so as to maximize the reusability of behaviors in a broarder range of different objects. The presented approach is based on creating a generic set of low-level behaviors that can be combined to achieve more abstract, complex behaviors. As a testbed, the speaker and his colleagues have modeled their computer science department building with some actors and working furniture, and also a small industrial site.

$\boxed{2}$

9:30–10:00
Towards Virtual Surgery

Roni Yagel
Ohio State University

The fields of computer graphics, image processing, parallel algorithms, volume visualization and virtual realities meet in some of today's most demanding applications. One such application is the simulation of surgery on a virtual patient. The patient is first 'digitized' by a medical scanners such as CT, MRI or ultrasound. Surgery can then be planned, rehearsed, and redesigned while operating on the digital model in a non-threatening virtual environment.
While the potential benefits of the 'medical flight simulator' are immense, so are the technological barriers we confront. Some of the most demanding tasks are the management, manipulation and real-time display of thousands of megabytes of data, the realistic simulation of tissue deformation, the modeling and rendering of phenomena such as bleeding and swelling, and the delivery of convincing haptic, auditory, and visual feedback.
Clearly, the vision of virtual surgery is still far from being achieved. The speaker will introduce some of the research efforts by the Volume Graphics Research Group towards the realization of first-generation virtual surgery systems. He will describe the group's efforts in volume reconstruction, deformation of 3D models, rapid rendering and virtual environments, and demonstrate the utilization of this system in the real-world application of endoscopic sinus surgery simulation.

$\boxed{3}$

10:00–10:30
Marching Gradients—A Fast Iso-Surface Extraction Method

Olga Tebeleva
Technion—Israel Institute of Technology

The speaker will present an algorithm (developed jointly with Gershon Elber) that, given an explicit trivariate hypersurface defined over a three-dimensional image data set $\mathcal{D}$ and an iso-surface S_1 of $\mathcal{D}$ at some iso-value v_1, extracts a new iso-surface S_2 at iso-value v_2, with v_2 sufficiently close to v_1. Off-line continuous reconstruction of $\mathcal{D}$ as a high-order B-spline trivariate is employed, yielding a linear time complexity for the extraction of S_2 in the size of the data of iso-surface S_1. The end result allows real-time incremental modification of the iso-value. Hence, users can potentially modify and refine an extracted iso-surface to a precise iso-value, in an interactive manner.

10:30–11:15
Coffee Break