4

11:00–11:30

Efficient Compression and Rendering of Multi-Resolution Meshes*

Alexander Bogomjakov
CGGC, Technion

We present a method to code the multiresolution structure of a 3D triangle mesh in a manner that allows progressive decoding and efficient rendering at a client machine. The code is based on a special ordering of the mesh vertices which has good locality and continuity properties, inducing a natural multiresolution structure. This ordering also incorporates information allowing efficient rendering of the mesh at all resolutions using the contemporary vertex buffer mechanism. The performance of our code is shown to be competitive with existing progressive mesh compression methods, while achieving superior rendering speed.
*** Joint work with Zachi Karni and Craig Gotsman.**

5

11:30–12:00

Spline Subdivision Schemes for Compact Sets*

Nira Dyn
Tel-Aviv University

Motivated by the problem of the reconstruction of 3D objects from their 2D cross sections, we consider the use of spline subdivision schemes operating on data consisting of compact 2D sets. A spline subdivision scheme generates from such data a sequence of piecewise-linear functions, with compact 2D sets as images, which converges to a limit function with compact 2D sets as images (set-valued function). This set-valued function describes a 3D object.
*** Joint work with E. Farkhi.**

6

12:00–12:30

OpenGL Vizserver

Yochai Shefi-Simchon
Silicon Graphics Israel

OpenGL Vizserver is a transparent software solution which allows a desktop user to view and interact with OpenGL applications running on high-end graphics machines, as well as collaborating with other users. The talk will cover the motivation behind OpenGL Vizserver and the VAN (Visual Area Network) concept, the problems it solves, its architecture and way of operation and its future development plans.

INVITATION

ISRAEL SIGGRAPH PROFESSIONAL CHAPTER MEETING

Sponsored by

Silicon Graphics (Israel) Ltd.

November 15, 2002
8:30–12:30
Ivcher auditorium
Inter-Disciplinary Center
Herzlia

Chair: Alla Sheffer
Technion

Free parking available next to the campus. Directions at: http://www.idc.ac.il/eng/content/Bigmap.asp Turn right when you enter the campus and walk to the statues garden.

8:30–9:00
Refreshments

$\boxed{1}$

9:00–9:30
Constrained Synthesis of Textural Motion for Animation*

Shmulik Moradoff
Hebrew University, Jerusalem

Obtaining high quality, realistic motions of articulated characters is both time consuming and expensive, necessitating the development of easy-to-use and effective tools for motion editing and reuse. We propose a new simple technique for generating constrained variations of different lengths from an existing captured or otherwise animated motion. Our technique is applicable to textural motions, such as walking or dancing, where the motion sequence can be decomposed into shorter motion segments without an obvious temporal ordering among them. Inspired by previous work on texture synthesis and video textures, our method essentially produces a re-ordering of these shorter segments. Discontinuities are eliminated by carefully choosing the transition points and applying local adaptive smoothing in their vicinity, if necessary. The user is able to control the synthesis process by specifying a small number of simple constraints.
*** Joint work with Dani Lischinski.**

$\boxed{2}$

9:30–10:00
Verification of Scanned Engineering Parts with CAD Models based on Discrete Curvature Analysis*

Boris Lipschitz
Technion

The manufacturing industry constantly needs to verify machined objects with the original CAD models. Given a prototype design of a solid model, the manufacturing engineer should be able to determine whether the part was manufactured well, that is, whether it fits the CAD model exactly. But in many cases, spatial fitting of corresponding points is not sufficient. The current work attempts to check the possibility of comparing the curvatures of corresponding objects. Curvature is an invariant surface property that is not affected by the choice of the coordinate system, the position of the viewer, and the particular parameterization of the surface. In recent years advances in 3D scanning technology have enabled highly accurate results with relatively low noise. Nevertheless, derivative computation is unstable for real data, and the estimated curvature is thus very noise-sensitive. The proposed method is applied on a given mesh, which is constructed from sampled points. The curvature for triangular meshes is not defined. The faces are flat and thus have zero curvature, and only continuity at the vertices as edges. However, triangle faces are piecewise linear approximations of the sampled object. So, the curvature of unknown surfaces can be estimated by extracting information from the triangular mesh. Most algorithms can approximate the curvature of synthetic meshes quite accurately, but they fail with real noisy data. In the current research algorithms that deal with noisy data were implemented. Some of them were extended in order to improve the results.
*** Joint work with Anath Fischer.**

$\boxed{3}$

10:00–10:30
Example-Based Image Completion*

Iddo Drori
Tel-Aviv University

We present a new method for completing the hidden parts of an image based on the visible parts, including shape, color and texture. Our goal is reconstructing the hidden parts, to get a small error with high confidence, and to synthesize a complete, visually plausible, and coherent image. We introduce an example-based completion method which utilizes the visible parts of an image as a training set to infer the hidden parts. Our approach is to first approximate the hidden parts using a fast multi-grid method, and then complete the details according to the most similar and frequent examples by adaptive tessellation. We demonstrate our method by seamless completion of various paintings and images.
*** Joint work with Daniel Cohen-Or and Hezy Yeshurun.**

10:30–11:00
Coffee Break