

WYSIWYG NPR

Drawing Strokes Directly on 3D Models

Group Presentation
Christian Graf, Qinglei Meng, Yuman Huang

Problem to Solve

- ✦ Interactive Non-Photorealistic-Rendering: give artist control over the **look** of a scene
- ✦ View-dependant automatic adaptation of stroke numbers and placement

Basic Concepts

- ✦ 'Environment': Background colour/image & Base coat shader
- ✦ Stroke: Colour, opacity, width, narrowing at endpoints, halo
Rendered as triangle strip (optionally textured)
- ✦ Silhouette & Creases: Basis of a drawing
Shows shape of object
- ✦ Hatching: Conveys light & tone from different density of one-colour pencil strokes
- ✦ Media Simulation: Important for overall impression of drawing, style dependent

Solutions & Inventions

- ✦ Decal Strokes: Spline curves projected on the surface
- ✦ Crease Strokes: Pixel displacement in offset lists plus scaling
- ✦ Synthesis of strokes: Rubber-stamping
From given example set
- ✦ Silhouette rendering: Combination of three algorithms
Result: run-time solutions with animation support
- ✦ Mobile/Structured/Free Hatching: Dynamic behaviour

Problems & Limitations

- ✦ Animation is not fluent, no real-time rendering possible
- ✦ Filling areas with strokes by hand is tedious
- ✦ The system does not support:
 - Local silhouettes
 - Hatching on uneven surface regions
 - Inferring lighting in response to hand-drawn shading
 - Object interplay such as shadows and reflections
 - Styles based on short strokes such as stippling and pointillism

Results

- ✦ Artists have control over the system and can design appropriate detail to make a scene interesting from different views
- ✦ Automatic features of the system present the details of complex geometry
- ✦ Limited control for animation rendering is supported

Original objectives are met, but implicit aim of real-time rendering lacks further improvement

