Tutorial 04
Real-Time Collision Detection for Dynamic Virtual Environments

Presenters:
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Motivation
• CD is enabling technology

Assembly Simulation
Virtual Cities
Ergonomics Investigation
Challenges

• Problem Statement:
  – Arbitrary set of polygons ("polygon soup")
  – No assumption about motion of objects
  – Size: 100,000 polygons / object
• Self-collisions
• Collision information
• Deformation
• Performance
  – Time-critical for real-time, interactive applications

Approaches

• Bounding volume hierarchies
• Distance fields
• Stochastic methods
• Continuous Detection
• Spatial subdivision
• Image-space techniques
• Other representations: Point clouds
Slides Online

- Current version of the slides will be made available at

  http://web.cs.uni-bonn.de/~zach/talks/vr05_colldet_tut/

Outline

1. S. Kimmerle: Bounding Volume Hierarchies
2. Ragupathi, Zachmann: Stochastic methods
3. L. Ragupathi: Continuous collision detection
4. A. Fuhrmann: Distance fields
5. Coffee Break
6. M. Teschner: Spatial subdivision
7. B. Heidelberger: Image-space techniques
8. G. Zachmann: Point clouds