ICG2009 Final Project

Cute War

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Goal

- I want to survey and implement some novel real-time rendering techniques
- I want to write a little game!
About the Game

Cute War

Play
Single

Play
Double

Instruction & Gallery

Game Single

Game Double

Instruction
About the Game

• Instruction & Gallery
About the Game

- Play Single: clear all the enemies
About the Game

• Play Double: PK mode
About the Game

• What can player do?
  - Eat Food
  - Equip Gun and reinforce bullets
About the Game

• What can player do?

Drive Transports
About the Game

• What can player do?

Bomb!!
About the Techniques

- Parallax Occlusion Mapping (POM)
  - Dynamic Parallax Occlusion Mapping with Approximate Soft Shadows, Natalya Tatarchuk, I3D ’06
About the Techniques

- Parallax Occlusion Mapping (POM)
  - Implementation Result
About the Techniques

- Percentage-Closer Soft Shadows (PCSS)
  - Percentage-Closer Soft Shadows, Randima Fernando, SIGGRAPH ’05 Sketches
About the Techniques

- Percentage-Closer Soft Shadows (PCSS)
  - Implementation Results
About the Techniques

• Tone Mapping
  – Photographic Tone Reproduction for Digital Images, Erik Reinhard et al., SIGGRAPH ‘04
  – Implementation Results
Others

- Modeling
  - 3DSMAX + Download from Web
- Rendering
  - Particle System (Point Sprites)
  - Billboards
- Game
  - Collision Detection / Response
  - Sounds
Implementation

- DirectX 9.0c
- HLSL shader model 3.0
Results

• Screenshot
Results

- Screenshot
Results

- Screenshot
Future Works

• Global Illumination Approximation
  – Screen-Space Ambient Occlusion (SIGGRAPH ’07 Course)

• One-Bounce Indirect Lighting
  – Screen-Space Directional Occlusion (I3D ’09)
  – Reflective Shadow Maps (I3D ‘05)
References

• Real-Time Relief Mapping on Arbitrary Polygonal Surfaces, Fabio Policarpo et al., I3D ‘05
• Dynamic Parallax Occlusion Mapping with Approximate Soft Shadows, Natalya Tatarchuk, I3D ’06
• Percentage-Closer Soft Shadows, Randima Fernando, SIGGRAPH ‘05
• Sketches
• Photographic Tone Reproduction for Digital Images, Erik Reinhard et al., SIGGRAPH ‘04
References

• Finding Next Gen – CryEngine2, Martin Mittring, SIGGRAPH ‘07 Course
• Approximate Dynamic Global Illumination in Image Space, Tobias Ritschel et al., I3D ’09
• Reflective Shadow Maps, Carsten Dachsbacher et al., I3D ’05

• DirectX SDK Samples
• NVIDIA SDK Samples
• DirectX SDK Documentation