User Guide

Vertex Texture Fetch Water

Introduction

What Is the Vertex Texture Fetch Water Sample?

The sample demonstrates a technique to render small to medium bodies of water using Vertex Texture Fetch (VTF). The water simulation is computed via a pixel shader. The simulation result is transformed into geometry using VTF in the water's vertex shader. Screen-space refraction and reflection maps are combined with a Fresnel term to give the water a realistic appearance.

For more detailed information, refer to:

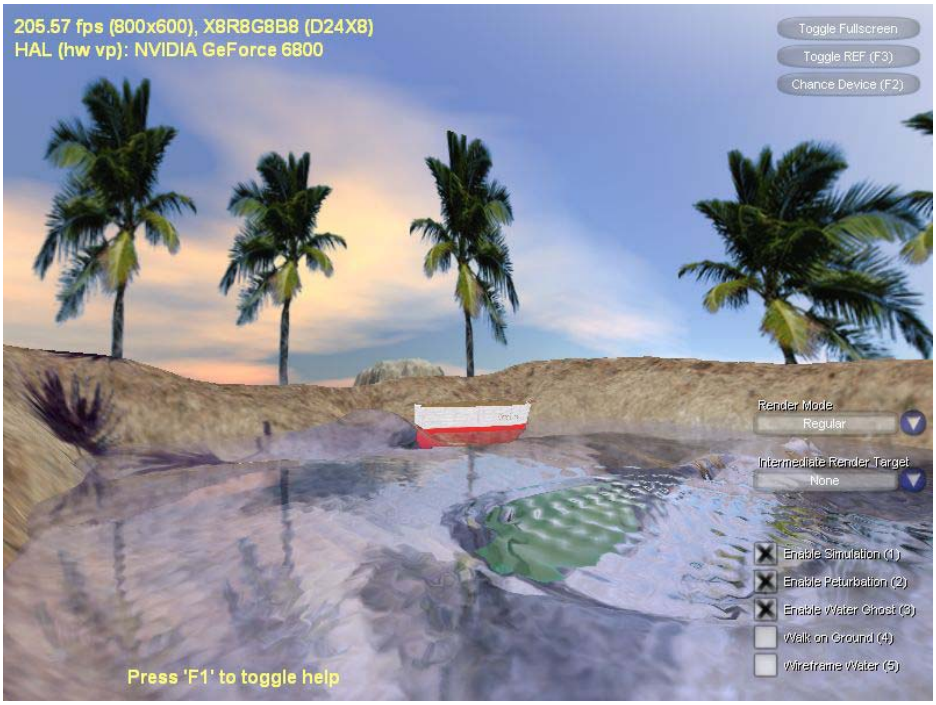
- Vertex Texture Fetch Water whitepaper at ./VertexTextureFetchWater.pdf.

What Are the System Requirements?

The sample uses Vertex Texture Fetch which is a Vertex Shader 3.0 (VS3.0) feature. There is no fallback to Software Vertex Processing for GPUs that do not support VS3.0. If using a GPU that does not support VS3.0, the sample will run on RefRast.

When you launch the sample, you will see the scene depicted in Figure 1. The viewer is standing near a pool of water bordered with a small amount of land. There is a boat that circles the water causing a wake. There is also a "Water Ghost" that zooms around perturbing the water; this makes the water active for demonstration purposes.

Figure 1: Vertex Texture Fetch Water on Launch



Controls

The sample can be controlled by the GUI, the keyboard and the mouse. The GUI and keyboard controls are included in Table 1 and Table 2.

While holding down the left mouse button, you can drag the camera orientation around. If Mouse Camera Control is enabled (toggle by pressing 'M'), the camera orientation follows the mouse without holding the left mouse button.

Table 1: GUI Controls

Control	Description	
Render Mode	Regular	Renders the final water effect.
	Refraction	Renders the refractive contribution to the water.
	Reflection	Renders the reflective contribution to the water.
	Fresnel	Renders the Fresnel term used to combine the refractive and reflective terms.
	Normals	Renders the world space surface normals.
Intermediate Render Target	Refraction	Displays the refraction map.
	Reflection	Displays the reflection map.
	Refraction Near	Displays the refraction map for objects that penetrate the water.
	Simulation	Displays the simulation of the wave equation.
Enable Simulation	Enables or pauses the water simulation.	
Enable Perturbation	Enables or disables the addition of perturbations (such as the boat wake) to the water simulation.	
Enable Water Ghost	Enables or disables a "ghost" that sweeps around the watering perturbing its surface. This makes the water less calm and more visually interesting.	

Control	Description
Walk on Ground	When enabled, the camera maintains a constant height above the terrain (depending on where the camera is positioned). When disabled, the camera does not track the terrain.
Wireframe Water	Toggles between a fully-rendered water surface and a wireframe water surface.
Toggle Fullscreen	Toggles between windowed and fullscreen modes.
Toggle REF	Toggles the Reference Rasterizer on or off.
Change Device	Allows you to specify D3D Device parameters.

Table 2: Keyboard Controls

Key	Description
W, A, S, D	Movement control
E	Move up
Q	Move down
1	Hot Key for "Enable Simulation"
2	Hot Key for "Enable Perturbation"
3	Hot Key for "Enable Water Ghost"
4	Hot Key for "Walk on Ground"
5	Hot Key for "Wireframe Water"
M	Toggle mouse camera control. When enabled, the mouse is captured and controls the camera orientation. To regain regular use of the mouse, disable camera mouse control.
F1	Toggle help
Alt + Enter	Toggle Full screen mode
Esc	Exit

Known Bugs

- Some keys control the sample even when the sample does not have the key focus.
- The simulation is using a fixed time-step that does not adjust to real-world time.
- There is no fallback method for the sample to run with software vertex processing.

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