WIREMOD

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Thread: CPU - GPU Terrain Rendering

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☐ 01-16-2014   #1

Yevano ○

Wirererer

WIREMOD MEMBER

Yevano's Avatar

Join Date: May 2010
Location: US
Posts: 370

📄 **CPU - GPU Terrain Rendering**

About a week ago I was extremely happy to see the GPU was in a mostly working state, so I decided to start working on something.

Pics:
http://yevano.me/shr/gm_flatgrass0026.jpg
http://i.imgur.com/vUWd0wp.jpg?1?9001

GIF: http://yevano.me/shr/2014-01-12_23-36-59.gif

The idea in this project is to generate terrain vertex data on the CPU and send it to the GPU to be rendered. The generator and renderer swap vertex buffers so that the terrain doesn't get torn up. (i.e. the rendered vertex buffer isn't being changed by the generator). I also got this working with textures, but it doesn't look too good without lighting (can't seem to get that to work the way I want).

The other point of interest here is the demonstration of communication between the CPU and the GPU. This could be extended to something more practical like rendering for games which is controlled by the CPU but rendered by the GPU.

Now, there are some technical difficulties with actually running this thing. First of all, you'll need to increase the usermessage limit to allow the all these vertices to be sent. (It wouldn't be so bad, but this particular render actually generates continuously to make a wave effect.) If the animation seems unbearably slow, try increasing the CPU frequency until it starts to effect your actual game fps. You can also manually change the size of the render to a smaller value if you have the time.

Wiring:
Code:

```
CPU.MemBus->GPU
CPU.Frequency->Constant(1-2M seems to work okay.)
CPU.Clk->Button.OutCPCPU.Reset->Button.Out
```

If the GPU is blank, try clicking the spawned GPU again after you spawn it. Make sure the CPU is properly attached and turned on so it will generate vertices for the GPU.

*3 8

Code:

```
data
#include <drivers\drv_gl.txt>

float *cameraPos = 5000; // 3
float *cameraTarget = 5003; // 2
float *terrSwap  = 5006; // 1
float *terrain0  = 5007;
float *terrain1  = 9615;

code {
    glCoordPipe(GL_CPIPE_N1_1); // -1..1
    glVertexPipe(GL_VPIPE_XYZTRANSFORM);

    glLightPos(20, -20, 0);
    glLightColor(255, 255, 255, 255);

    glPerspective(30, 1, 1, 40);

    glEnable(GL_VERTEX_BUFFER);
    glEnable(GL_VERTEX_ZSORT);

    glLookAt(
        cameraPos[0], cameraPos[1], cameraPos[2], // Camera pos
        cameraTarget[0], cameraTarget[1], cameraTarget[2], // Camera target
        0, 1, 0 // Camera up
    );

    glVertexMode(1);
```

& 3 8Note: This is all really unoptimized.

Code:

```
data
float *cameraPos = 65536 + 5000; // 3
float *cameraTarget = 65536 + 5003; // 3
float *terrSwap  = 65536 + 5006; // 1
float *terrain0  = 65536 + 5007;
float *terrain1  = 65536 + 9615;

code {
    cameraPos[0] = 0;
    cameraPos[1] = -20;
    cameraPos[2] = -20;

    cameraTarget[0] = 0;
    cameraTarget[1] = 0;
    cameraTarget[2] = 0;

    while(1) {
        float time;
        timer time;
        time /= 4;
        float m;
        fsin m, time;
        cameraPos[0] = m * -20;
        fcos m, time;
        cameraPos[2] = m * -20;
        time *= 16;

        float *t
```

Share

Will sex for rep.

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'UXQ Nᴸ H

Ursus maritimus

SUPER MOD

Join Date: Feb 2009
Location: Canada
Posts: 6,625
Blog Entries: 1

Re: CPU - GPU Terrain Rendering
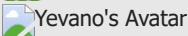
That's awesome

Also, TIL gl driver still works

Share

Yevano

Wirererer

MEMBER

Yevano's Avatar

Join Date: May 2010
Location: US
Posts: 370

Re: CPU - GPU Terrain Rendering

The weird thing is it wasn't working like a week or two ago. I guess somebody fixed GPU things.
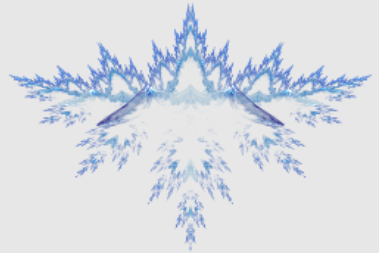
Share

Will sex for rep.

&RORQHO 7Kᵇ UW\ 7ZR

I need scissors. 61

DEVELOPER

Join Date: Oct 2009
Posts: 4,152
Blog Entries: 5

Re: CPU - GPU Terrain Rendering

> **Originally Posted by Yevano**
>
> *The idea in this project is to generate terrain vertex data on the CPU and send it to the GPU to be rendered. The generator and renderer swap vertex buffers so that the terrain doesn't get torn up. (i.e. the rendered vertex buffer isn't being changed by the generator).*

Just like a real C/GPU

01-16-2014 #5

'U X Q N L H
Ursus maritimus

WIREMOD SUPER MOD

Join Date: Feb 2009
Location: Canada
Posts: 6,625
Blog Entries: 1

Re: CPU - GPU Terrain Rendering

> Originally Posted by **Colonel Thirty Two**
> *Just like a real C/GPU*

Yes.

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-- Wiremod Reborn