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AFFIDAVIT OF CHRISTOPHER BUTLER

1. I am the Office Manager at the Internet Archive, located in San Francisco, California. I make this declaration of my own personal knowledge.

2. The Internet Archive is a website that provides access to a digital library of Internet sites and other cultural artifacts in digital form. Like a paper library, we provide free access to researchers, historians, scholars, and the general public. The Internet Archive has partnered with and receives support from various institutions, including the Library of Congress.

3. The Internet Archive has created a service known as the Wayback Machine. The Wayback Machine makes it possible to surf more than 450 billion pages stored in the Internet Archive's web archive. Visitors to the Wayback Machine can search archives by URL (i.e., a website address). If archived records for a URL are available, the visitor will be presented with a list of available dates. The visitor may select one of those dates, and then begin surfing on an archived version of the Web. The links on the archived files, when served by the Wayback Machine, point to other archived files (whether HTML pages or images). If a visitor clicks on a link on an archived page, the Wayback Machine will serve the archived file with the closest available date to the page upon which the link appeared and was clicked.

4. The archived data made viewable and browseable by the Wayback Machine is compiled using software programs known as crawlers, which surf the Web and automatically store copies of web files, preserving these files as they exist at the point of time of capture.

5. The Internet Archive assigns a URL on its site to the archived files in the format `http://web.archive.org/web/[Year in yyyy][Month in mm][Day in dd][Time code in hh:mm:ss]/[Archived URL]`. Thus, the Internet Archive URL `http://web.archive.org/web/19970126045828/http://www.archive.org/` would be the URL for the record of the Internet Archive home page HTML file (`http://www.archive.org/`) archived on January 26, 1997 at 4:58 a.m. and 28 seconds (1997/01/26 at 04:58:28). A web browser may be set such that a printout from it will display the URL of a web page in the printout's footer. The date assigned by the Internet Archive applies to the HTML file but not to image files linked therein. Thus images that appear on a page may not have been archived on the same date as the HTML file. Likewise, if a website is designed with "frames," the date assigned by the Internet Archive applies to the frameset as a whole, and not the individual pages within each frame.

6. Attached hereto as Exhibit A are true and accurate copies of printouts of the Internet Archive's records of the HTML files or PDF files for the URLs and the dates specified in the footer of the printout (HTML) or attached coversheet (for PDF).

7. I declare under penalty of perjury that the foregoing is true and correct.

DATE: 2/24/17



Christopher Butler

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See Attached Document.

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Subscribed and sworn to (or affirmed) before me on this

24th day of February, 2017, by

Christopher Butler,

proved to me on the basis of satisfactory evidence to be the person who appeared before me.

Signature: Laurel Karr



FXT1: 3dfx Texture Compression

by Bubba "Masterfung" Wolford

Introduction

Every week it seems we are getting a new announcement about 3D technology. Recently, [Nvidia and S3](#) both announced their chip specs.

While S3's Savage 2000 was taken with some skepticism at first because the specs looked so strong, others simply dismissed it as being another S3 offering that would never amount to anything, insisting that the rumored NV10 would, "blow it away." The next day, Nvidia announced their next generation chipset, the GeForce 256. Yesterday, over a conference call, 3dfx announced another new technology that will be implemented in their next generation chip.

3dfx Texture Compression: FXT1

My questions about FXT1 were very similar what you are all probably thinking right now: what is FXT1, what will it do for me and how is it different from what S3 has done with their own texture compression, S3TC?

FXT1 is a new technology that uses texture compression to compress textures using a four point encoding algorithm (as opposed to a single point algorithm used by S3) to condense textures to as much as 1/8th their size. The texture is coded into the game, flagged to be compressed by the hardware, and then compressed into memory using one of the 4 algorithms that decide the best way to encode the scene to minimize any loss in visual quality.

Next the texture is decompressed after identifying which algorithm was used to compress the texture, and is rendered on the scene all the while improving framerate and leaving more memory bandwidth open to be used as storage for more textures or by texture mipmaps. This encoding and decoding is done through hardware allowing the card and CPU to continue rendering frames as fast as possible.

The following chart demonstrates the three 3dfx texture compression algorithms and how they might be implemented. You can also see here the S3TC algorithm. FXT1 provides the most accurate image reproduction when measuring the Root Mean Square error of each encoding algorithm. Without question, since 3dfx uses a variety of measures they are always going to see superior image reproduction.

First off, let me give you an example of what kinds of advantages texture compression offers. Suppose we have a texture that is 2048x2048 and 32-bit per texel. That texture will require a whopping 16 Mbytes of total memory space to store it locally in the texture memory of the video card! Keep in mind that this is only a single high-resolution texture!

3dfx's FXT1 could compress this texture to a size of 2048 Kbytes and thus free all the extra bandwidth for storing more textures! Since these textures are stored in the local memory of the video card, we have almost instantaneous framerate transfer and much higher fill-rates from the video card to your monitor!

Since 3dfx is using greater compression than S3's S3TC, we can look at this chart and see how 3dfx's FXT1 will be compressing textures:

Texture Size	8-bit	16-bit	24-bit	32-bit	4-bit FXT1**
64x64	6 KB	9 KB	13 KB	16 KB	2 KB
128x128	15 KB	23 KB	33 KB	40 KB	5 KB
256x256	36 KB	53 KB	76 KB	95 KB	12 KB
512x512	88 KB	131 KB	189 KB	236 KB	29 KB
1024x1024	216 KB	327 KB	467 KB	584 KB	73 KB
2048x2048	540 KB	818 KB	1169 KB	1460 KB	181 KB

Another advantage to 3dfx's texture compression is that it will be FREE to anyone. The code (open set source code) will be released to the public and is available to anyone. 3dfx is encouraging everyone to use the code and perhaps even tell them how they can improve upon the code.

There will be no license or royalty fees charges to use the technology. Plus, the new technology will be open to any OS, Windows, Mac, Linux and, hopefully, BeOS. Of course, 3dfx is making FXT1 available to all three major API's as it will be standard on Glide and open to D3D and OpenGL.

Go to [Part II: How It Works](#)



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