Subject: IDL virtual reality (was 3D Object IDL)
Posted by george on Wed, 08 Aug 2001 08:52:45 GMT
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Hi There,
Thanks for your input. Actually I am well aquainted with the "flicker glasses" technique. I have done a fair amount of 3d animation and used both the "flicker glasses", and twin polarised projectors, as the virtual reality technique. However, up till now my method has been to render 2 separate animations in IDL (one for left, one for right) and then recombine these in special 3D video software to create the final virtual reality scene. This works fine - but is completely "offline". So, my question here is how to do this in fully interactive mode. I am not thinking here about the actual 3D technique ("flicker glasses etc.") as much as how to achieve this within IDL. My question really is: What is the most efficient way to write 2 separate scenes (L and R) at the same time. I.E., are there any techniques in IDL that make this a "no brainer" - has anyone done this before ? I am really looking for technical IDL input. Do you write the data to the Z-buffer and alternate between the 2 scenes in real time (as fast as the render engine will do it) etc. etc. ?

Any help much appreciated.
Cheers ,

George Millward

"Rick Towler" <rtowler@u.washington.edu> wrote in message news:<9kp8m8$16n2$1@nntp6.u.washington.edu>...
> You might want to look into 3d shutter glasses. They work by alternately
> rendering a left and right eye view to the screen while simultaneously
> covering the opposite eye by darkening the lens. All of this is done at the
> driver level so you don't have to render your two views by hand.
>
> I would start with a consumer level product. Both Elsa (glasses are called
> Revelator) and Asus (glasses are called VR Spectacle) make glasses that work
> with some of their graphics cards for the PC. The glasses tend to be a
> little flimsy and aren't the most comfortable but they are cheap and a good
> place to start with this sort of thing. They do work quite well but I know
> some people that get headaches or sick to their stomachs using them.
>
> If you decide that shutter glasses are the way to go, you can start looking
> for a more professional product. I know they exist but I just haven't
> gotten that far.
>
> good luck!
>
> -Rick Towler

>
>
> "George Millward" <ghm@appleonline.net> wrote in message
> news:B795A847.14F%ghm@appleonline.net...
>> Hi there,
>>
>> I am wanting to generate full 3D output from IDL object scenes. I can do
>> this offline (i.e., create two different views in which the "eye" is
> offset
>> for left and right view). But I want to be able to do all this fully
>> interactively.
>> So my setup would be:
>> Computer running IDL - output to (maybe) 2 graphics cards - > 2 projectors
>> (with polarised filters) and then viewed using 3D (polarised glasses).
>>
>> In practice therefore I need a system for outputting 2 slightly different
>> images (left and right) of the same scene.
>> Does anyone know how to do this ? Are 2 graphics cards required or can it
> be
>> done with one ?
>>
>> Thanks in advance for any help.
>>
>> George Millward.
>>

Subject: Re: IDL virtual reality (was 3D Object IDL)
Posted by george on Thu, 09 Aug 2001 08:36:20 GMT
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Hi There,

Many thanks for the help on this one. It seems that full virtual
reality is actually very possible. Rick, thanks for the programs - I
really wasn't expecting custom built applications - but I am glad that
I have got some people excited.

This was a question from Dick:
> (Question: can you really get good pixel-for-pixel alignment across the
> whole display with two projectors? I've never seen it done, but of course
> this will be important for good results.)

I have been working with a 3D video film maker for a while now. We
have been making a variety of 3D films and the best way to show these
is to use the 2 projector system. It is bright, clear and can easily
be shown to between 50 and 100 people with no problems. All you do is
put a polarising filter over each projector. This ain't fancy - we

have always hired projectors and just taped a filter over the front. The 2 filters are set so the polarisation is 1) vertical and 2) horizontal. You can then buy polarising glasses. These are just cheap plastic glasses with polarising filters which are aligned horizontal and vertical for each eye. I am not sure which "lens" in the glasses is horizontal and which vertical - but obviously this needs to be set up so that the left eye is getting the light from the projector with the "left" scene, and likewise the right eye. OK - I imagine I am really just stating the obvious here. Now, the 2 images from the 2 projectors are aligned on the screen. But (this is the answer to Dicks question) the actual accuracy of the alignment is not as important as he implies. Ideally, you would want pixel by pixel accuracy - and the 2 projectors to be colocated etc. - but in such an ideal situation you would also want the viewer to be located totally "on axis". In reality, any slight deviations from this perfection is sorted out by the brain. I.E., suppose you are projecting a sphere into your 3D space (and lets face it - spheres are pretty popular). If some aspect of the system means that the two images are not totally properly located - then all that happens is that the brain compensates. you may have the impression of an object which isn't perfectly spherical - but not enough to ever give you worries. Other practical problems are the fact that the viewers are at different distances from the screen, and some are off to left/right etc. etc. The best effect is when the viewer is located relatively far back and "on axis". But all that happens as you move nearer is that the effect becomes more "radical" - the sphere moves towards you - appears very much to be hovering in space - and you eventually embarrass yourself by trying to reach out and touch it !! But I don't think that pixel by pixel alignment is totally necessary. Remember the left eye only sees what is coming from the left projector (and likewise for the right). Even if the 2 projectered images were misaligned by a centimetre or so - the brain would still recombine the separate images as a 3D scene.

From our experiences, using twin projectors is by far the best method for full virtual reality. You get a bright, full colour, totally 3D image with no flicker (flicker is a problem with the flicker glasses - unless you get a very high-end projection system that works at twice normal refresh rate - Also, flicker glasses are expensive and you have 50 people wired together !!).

I will dig out some literature on the polarising glasses - but I bet 10 minutes on google would give you the answers.

Lastly, our work so far has been video films - these are at comparatively low-resolution (i.e. standard TV resolutions). With IDL driving relatively modest projectors you could easily have a full 1024 * 768 system - and even higher if you can get someone to part with the money.

The whole system then becomes: computer with double head graphics card -> twin projectors -> 2 polarising filters taped over the lenses

-> polarising glasses. I haven't done it with IDL yet but I reckon
the results will be spectacular!!
I think the best way to set this all up would be to create the full 3D
system and then sit down with the glasses on and "tamper" with all the
free parameters (distance between the "IDL cameras"), i.e. just build
a widget interface and adjust until you get the best results.

OK, I have written too much - time to get on with it.
I will report back with any progress.

Cheers,

George.
