

Open Source 3D Package for Game Creation

# CRYSTAL SPACE



People sometimes have very good ideas for a game. So what do you do if you have such an idea? Well, first you design your game. You document what you want to happen in your game. You describe the mechanisms, the target, the goals, ... Depending on the type of game this can be a big task in itself. Jorrit Tyberghien seeks help.

**"Blocks" is a 3D tetris clone and is one of many games based on Crystal Space.**

Eventually, the time comes when you can start development on the game you've been dreaming up. But what happens? You end up doing a lot of work trying to get graphics, sound, and networking running when you would very much prefer to work on the game itself.

Programming a graphics engine is a difficult task, which is why it often takes a whole team of programmers to create a good game. If you have to do it all on your own you will need a lot of time.

So why not use a package for this? In this short article we examine the use of Crystal Space as a possible solution for this problem. Crystal Space is a set of libraries and modules that are mainly useful for programming 3D games. If you're about to create a 2D-only game then Crystal Space is not for you. (If that is the case you should perhaps look at other good libraries like SDL or ClanLib).

Crystal Space is Open Source. This means you can download it for free and use it in your own pro-

grams. Because Crystal Space uses the LGPL (GNU Library General Public License) you can even use it for making commercial games. You can download Crystal Space from <http://crystal.linuxgames.com>.

Crystal Space is also portable. It currently runs on Linux (all flavours), Windows (Win95, Win98, WinNT, Win2000), Macintosh, OS/2, BeOS, DOS, FreeBSD, SGI, Solaris, NextStep, OpenStep, MacOS/X, ... To do 3D rendering it can use OpenGL, Glide, Direct3D, or software rendering. This portability gives game developers a lot of choice in their potential game platform targets.

One bit of warning. Crystal Space is still in development. Various parts of Crystal Space work reasonably well already (for example, the 3D Graphics Engine) but some other parts need to be improved a lot before being usable (such as the 3D Sound Engine).

What does Crystal Space offer you? The three main parts of Crystal Space are a 3D Graphics

Engine, a 3D Sound Engine and networking support. These three major components are briefly explained in the following sections. Note that all these components are optional. You don't have to use 3D sound if you don't want to. You could choose to produce sound using another package for example.

## The 3D Graphics Engine

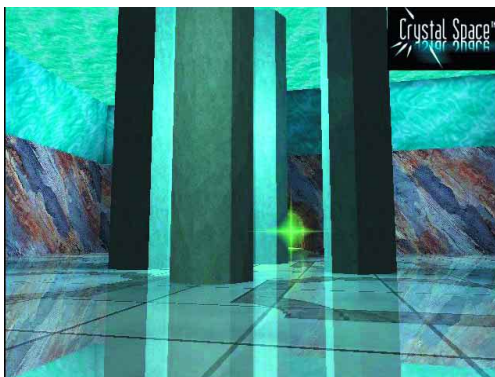
The 3D Graphics Engine is by far the most important part of Crystal Space and is actually the main reason that Crystal Space exists at all. This piece of software is responsible for managing a "world" in 3D and displaying it on screen. It contains features such as:

- visibility checking (so that the hardware doesn't have to work too hard);
- particle systems (to simulate things like rain, snow, and fountains);
- collision detection;
- physics simulation

and so on. Basically, it relieves the game programmer from the hard job of having to worry about the 3D management and rendering part of the project.

## The 3D Sound Engine

The sound engine is currently in heavy development. When it is finished it will be possible to



have real 3D sound (and normal sound as well) that is integrated with the 3D engine. For example, if there is a wall between the sound source and the camera the sound will become fainter. The sound will also appear to come from the right direction as well.

## Add-ons

Crystal Space contains a lot more than the three main parts we have mentioned. For example, there is also the Crystal Clear package which sits on top of the rest of Crystal Space and is responsible for controlling and interacting with game entities. Also planned is a facility to add scripting using various languages. Currently we are working on support for Python scripting but other options will be available in due course.

## Summary

So here it is. If you want to write a 3D game you should at least consider Crystal Space as an option. It could potentially save you a lot of work. If you have any questions about using Crystal Space just mail me at the address below. ■

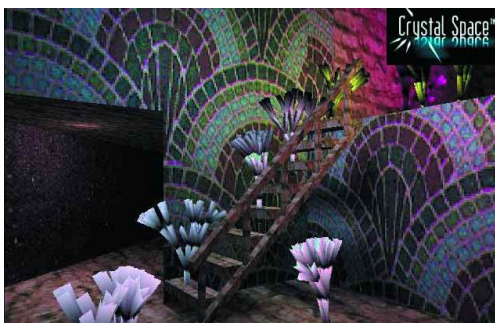
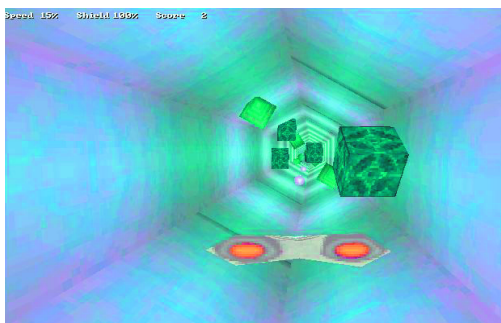


## INFO

*Crystal Space Homepage:*  
<http://crystal.linuxgames.com/>  
*Online-Manual:*  
<http://crystal.sourceforge.net/docs/online/manual/>  
*Game projects using Crystal Space:*  
<http://crystal.linuxgames.com/projects.html>

### Networking

*Not all games need networking support. However, if you are writing a role playing game or a Multi-User Dungeon (MUD) you can use Crystal Space for this. Crystal Space contains some basic low-level networking support as well as support for client-server networking operations.*



## The Author

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