

Game Development with Virtools Dev 3.0

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Abstract

There are many ways to enter the exciting world of Game creation, building a truly impressive 3D animated interactivity in Virtual Reality that can be controlled by a keyboard, mouse, joystick and in some extreme situations even your natural voice or a mobile phone. One way that can be seriously considered is the Virtools Development Environment.

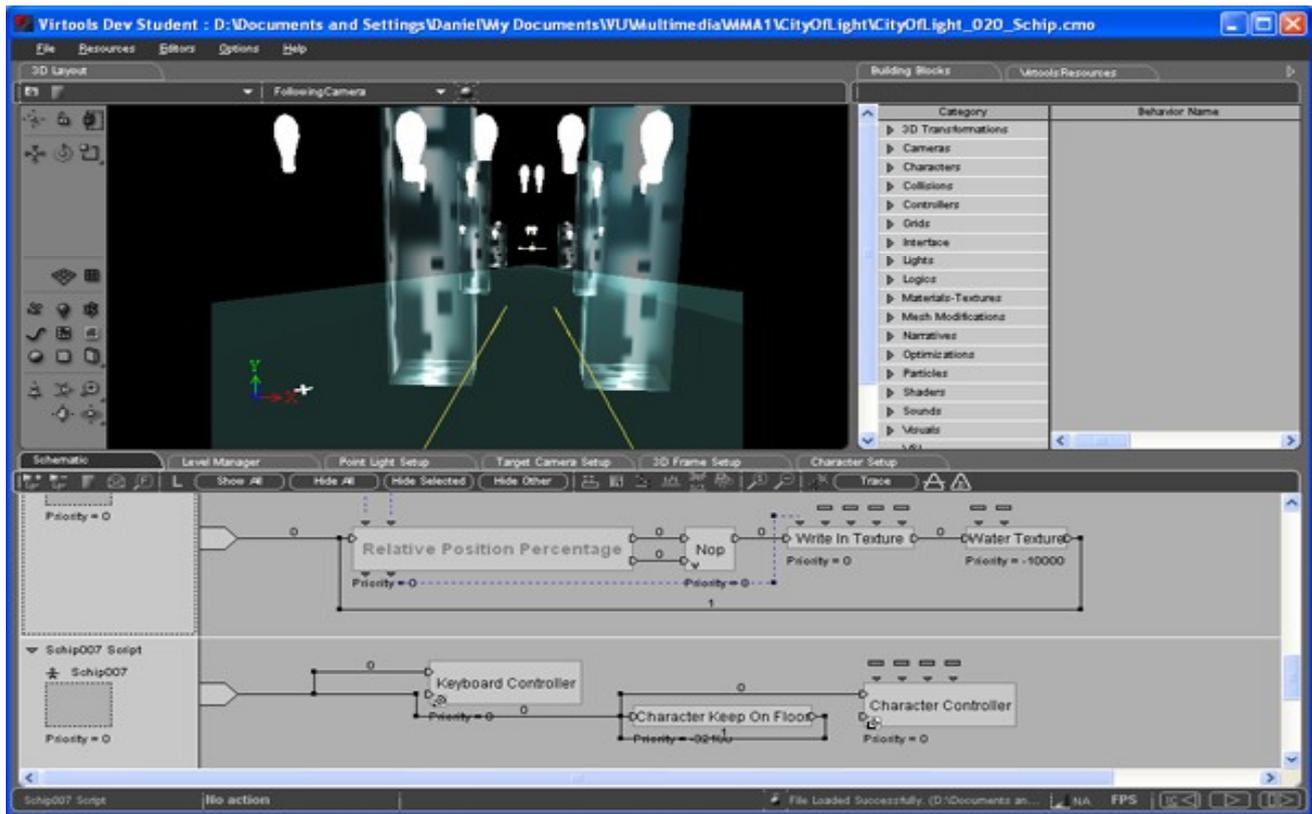
1. What is Virtools?

Virtools can be better understood by examining what you can and cannot do with it and such examination requires a major investment of time. First of all it has a look and feel of an editor, allowing you to import your existing reach media content in various formats. In other words: your 3D Models, animations, materials, lights, camera's from other industry leading 3D Modeling software packages like: Maya, 3DS Max, LightWave, your virtual worlds and environments that can be easily created with Bryce and of course your video and sound. Once all of that is contained in your Virtools project you can start building amazing interactivity, prototyping games, mimic natural phenomena's, simulate physical forces and much more, all that in no time with an ease of a mouse click.

As much as this all sounds truly impressive, it is mostly the commercial part of the story, the real story requires a great deal of knowledge and experience with both source application where you build and animate your 3D models (that have to be build and prepared in a very special way, according to the very strict guidelines in order to be legit for import into Virtools) as well as Virtools dynamics, usually called BB (Building Blocks). One may argue what Building Blocks really are. They look a bit scary at the first time and remind electronic circuits. They even work a bit like electronic circuits while accepting an incoming signal and parameters from the source object (that can be virtually almost anything) and producing the output signal that can be redirected to other BB's. Those BB's can be easily connected and all together form new functionality that can be assigned to the members of your composition. It is actually possible to create a very complex functionality and even create the entire game without writing a single line of code just by using BB's.

I saw BB's but I did never sing them a Love Song...

BB's are perhaps the most important part of the interface and maybe even the most expensive part of Virtools (which by the way costs around 7000 Euro on a market, what makes it automatically accessible for a very tiny number of developers), despite all that I didn't like BB's that much and would rather write code instead of playing with those expensive boxes.



Imagine to yourself a situation where something seriously goes wrong and I'm sure that everyone will sooner or later encounter such situation while using BB's. Apparently it is then very difficult to determine what exactly went wrong and why your animated character doesn't act the way you expect him or doesn't do what he just did a few seconds ago but stopped in a mysterious way. There is nothing that will point you to the location of an error. By the way, parameters already assigned to BB's can easily disappear (being replaced by NULL) and perhaps this is the time to say a word about the wonderful "Set IC for Selected" family of buttons that can be found almost in every window in Virtools and is the main reason of all those natural (or virtual?) disasters you will experience. IC stands for Initial Conditions. Each object imported into Virtools has those IC's, they can be set, restored or removed. While working on your project you are required to click thousands of times on this Set IC button (or his relatives) since Virtools is not smart enough to remember the setting you have entered into the box (the way Maya does it for example). Therefore forgetting to Set IC will probably cost you losing some of the functionality and the setting that you achieved after a very hard work and after BB's where finally so kind to produce such a wonderful result. There is no guarantee at all that your creations will still be there when you come back with a cup of coffee. Things get even worse when you see ("What You See Is What You Get" doesn't have any meaning in Virtools) that everything appears to be fine, you click the Play button and it actually Plays the right way (the right way is the way you expect it to play), immediately after that you Save your file, and guess what happens when you reload the program and open that file again? You did guess right, you see characters standing in wrong positions, some functionality is lost forever, camera might be blindfolded by looking into the black empty space assuming you can find your camera at all... and it doesn't play the way it did before you have saved your composition. Possible reasons: a) you forgot to click on a magical Set IC

button, b) some BB's did replace their input parameters by NULL (try to ask them why they did that...). By the way NULL means that your functionality is no longer assigned to the objects and that's a good reason for all those surprises that you are going to experience, c) I really don't know what that might be...

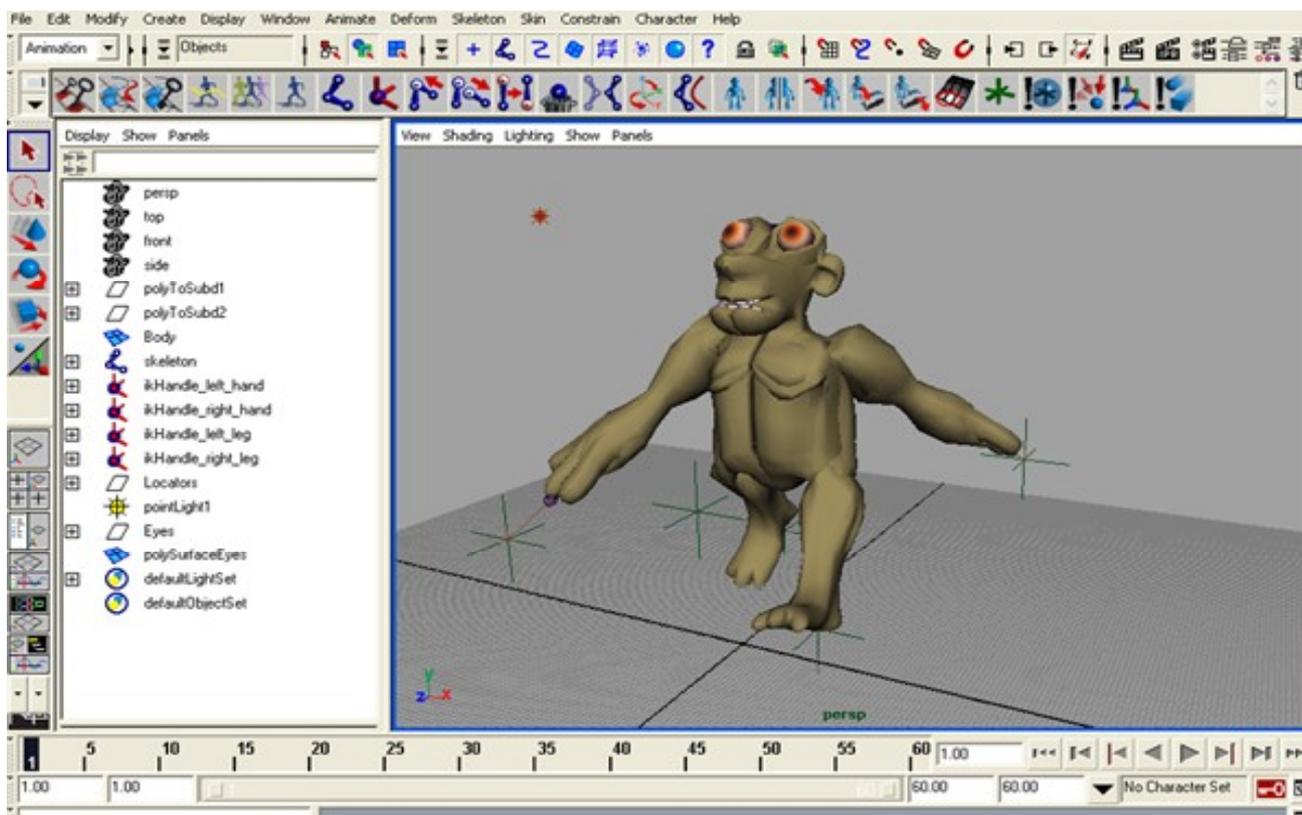
However, after a lot of fighting, Virtools and I did actually find a way to coexist. I didn't spare my fingers and my mouse clicks, and did make Set IC button very happy by constantly clicking on it. I did also click on Restore IC button before each Playback so he will not be jealous that Set IC get all the attention (you will not believe, but it is even recommended to do so in the documentation) I assume it is done just for a case that something already went wrong before playback, so you will never get the chance to see some other playback where everything is going well... then save it, then open it and then be very disappointed again...

2. Importing 3D Models and Animations from Maya

I was lucky to be able to learn how to work with Abstraction, which can really save you a lot of time in Virtools, help you better understand, test and even discover some serious limitations of your own creation all that before you actually build your final model and animate it in Maya or the software of your choice. It helps a lot to start from a very simple shape like a Cube and try to keep it on floor, let it move, rotate, fly or test how camera may follow it in the virtual world which for testing purposes doesn't have to be very complicated. If you succeeded to do that, save the file, close it, open it again and if you still see the same, only then you can make one serious step further. This step is about building a skinned skeleton, animate the model with inverse kinematics, organize all the elements of your model in a very strict hierarchy with a single root (otherwise you will not be able to import it into Virtools at all) and hope that everything will go just fine.

If my rabbit dies, should I get a second rabbit?

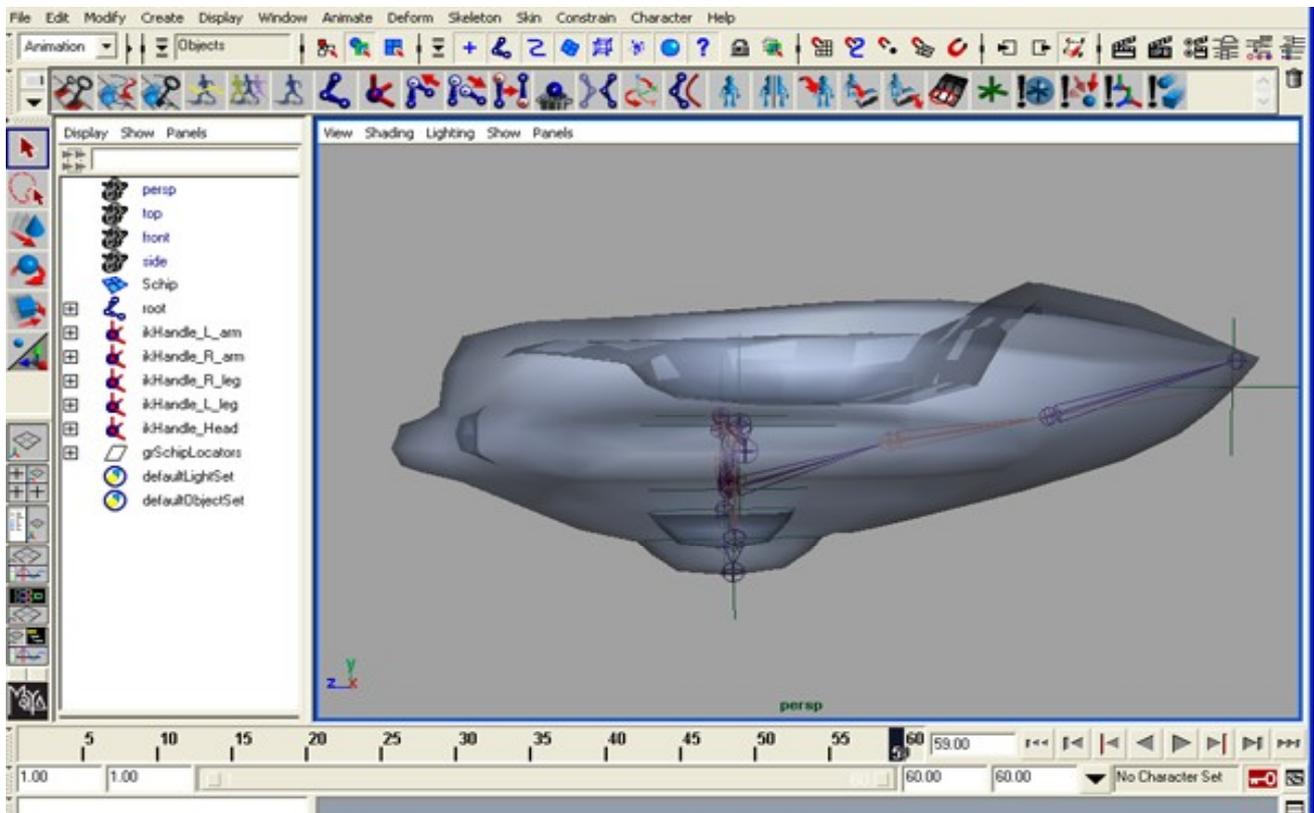
My first test rabbit was a monkey (probably because I wouldn't dare to test on humans directly, and didn't have the time to spend on rabbits).



One may say that my monkey doesn't really look like a monkey and it doesn't have a tail, but it is the first skinned skeleton I have made in my entire life and for testing purposes it doesn't really matter. It did look quiet

healthy to me and did walk! The walk animation is a standard 60 frames animation where frames 1 and 60 are the same, frame 30 is the frame where legs and hands are exactly in the opposite direction and frames 15 and 45 are adjusted accordingly to make the walk look smoother. From building the monkey I did learn that inverse kinematics are kind of limited to translating the locators which are nothing else than pointers to so called ikHandles in Maya, while you can not translate or rotate single joints of a skeleton. To be honest I don't understand why it is made this way, since I would like to have much more control on my character than moving the locators only. After this monkey was imported into Virtools something happened to the right eye. Right eye wasn't that lucky and became to be totally transparent while I did never modify any alpha setting in Virtools. I assume that something went wrong during the exporting in the texture mapping department. Besides the fact that I couldn't find the way to fix the right eye, everything else was working perfectly fine. I have attached Character controller and Keyboard controller BB's and my monkey was pretty much a live.

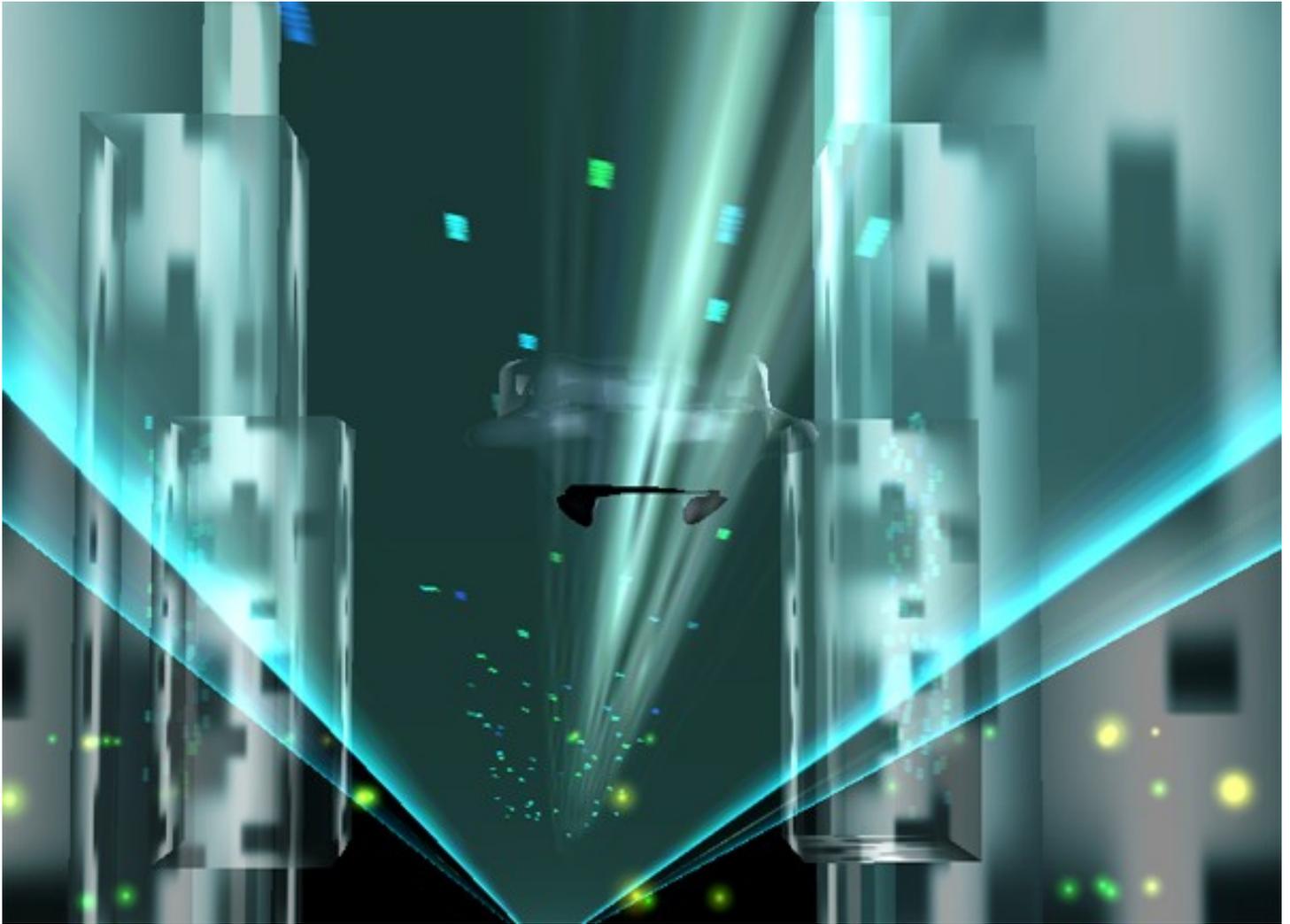
I did use exactly the same technique to build and animate the flying boat (or should I say the walking boat?) in the City of Light composition. It is also a skinned skeleton and the **walk animation** is 60 frames based. This boat has also a special **wait animation** where it smoothly slides from the left to the right side and this is what you see when boat is not controlled by the keyboard. This wait animation creates a much more realistic experience for the user than freezing the screen when boat doesn't fly. The following camera also moves to follow the boat translations when no key is pressed, all that to make you believe that you are actually sitting on that boat.



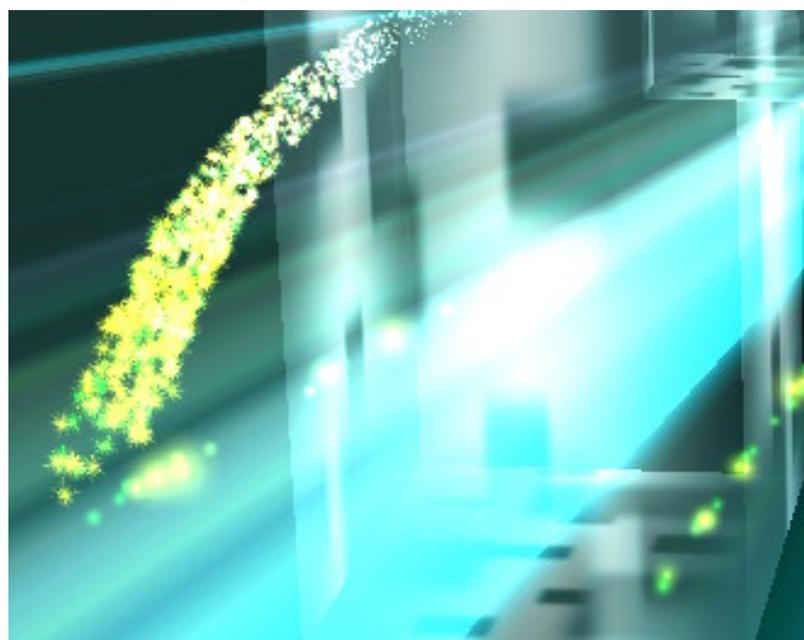
Was it an accident or intentional on your part?

Some special words must be said about the moving lights. All the special effects in the City of Light composition were created by using particle systems in Virtools, where possibilities are almost unlimited. Discovering particle systems did make me really like the French creators of this amazing tool. It does really worth to invest some time in studying how particle systems work since what you can do with them will probably cause you a lot of pleasure and satisfaction.

The moving textures on the buildings of the City of Light are controlled by the Texture slider BB. It was however not that simple since the textures need to be mapped in a very specific way in Maya to the walls of the building and all that have to be lit. After several tries I have succeeded to model a single building that did provide the illusion I wanted to create. That building was then cloned and scaled in Virtools to create a City.

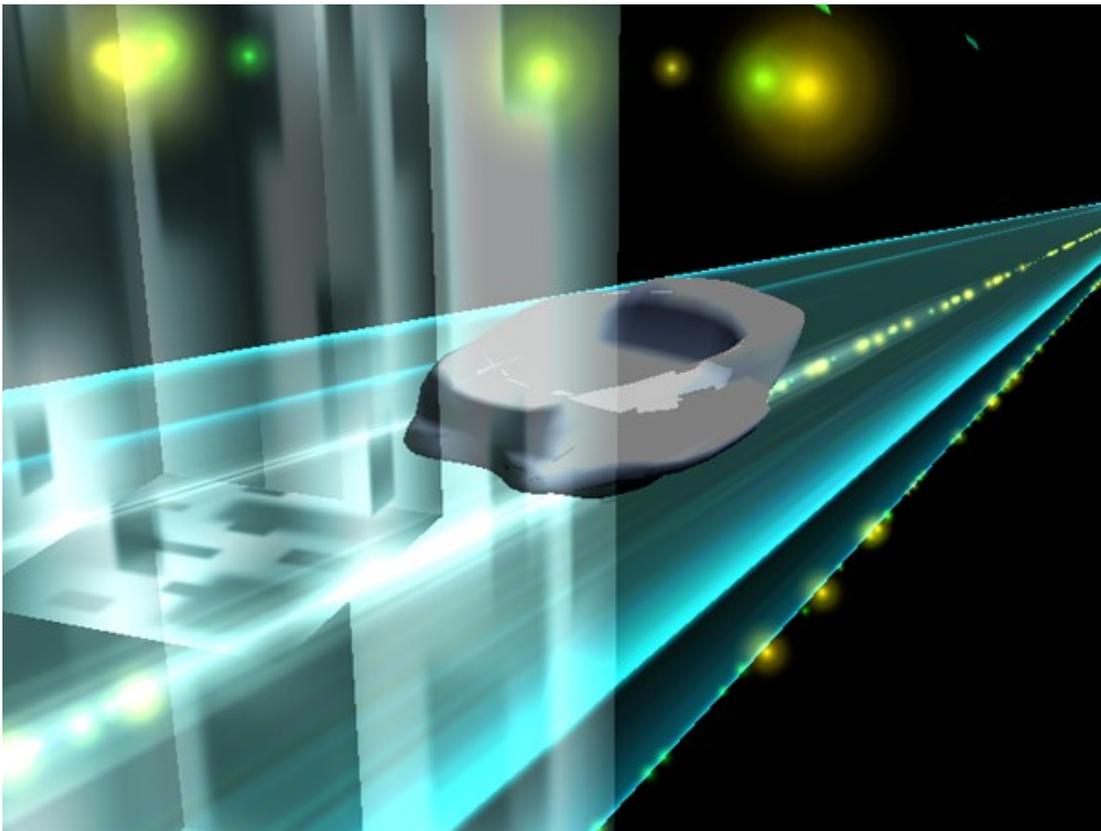
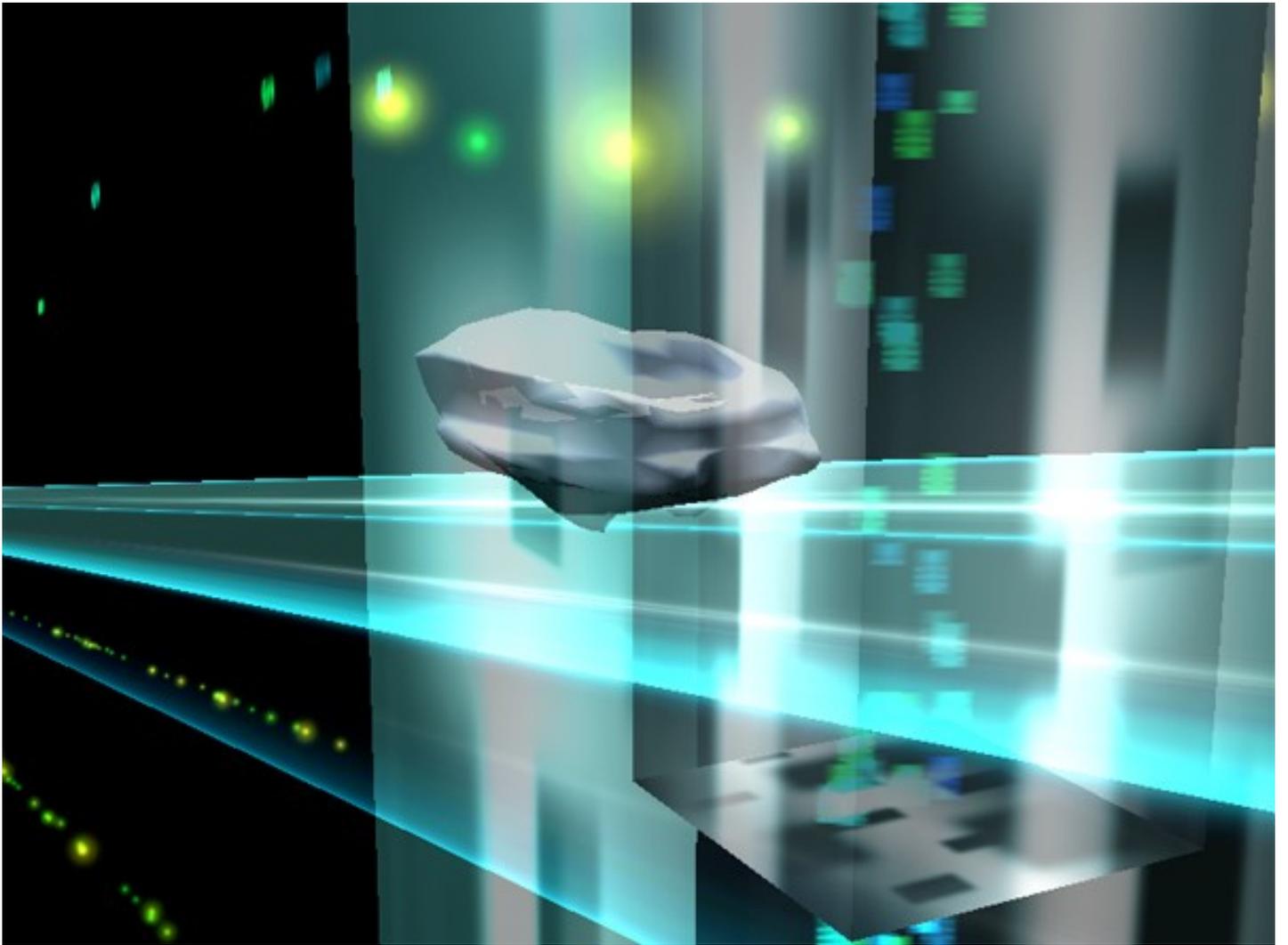


Boat can be controlled by the numbered keyboard keys [4], [8] and [6]. Boat can slide on the floor or it can fly.



However if you fly and cross the floor on your way then there is a very good chance that you will be grounded since boat is programmed to be kept on the floor as much as possible. Floor reacts on the position of a boat by producing a sort of electro-stimulated-water-light effect, which I can proudly say looks very nice especially if you are close to the buildings, since this is the area where most of the lights are located.

On your way you will probably meet a comet. A comet was created by using the Spherical partical system. This sphere has an oval shape and is constantly rotated around X Y Z. There are 2 Timers, 2 Rotate and 2 Set Position BB's associated with the Comet to control it's movements in space.



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