3D Computer graphics

Ideas, Standards and Tools

Clouds 02 - zazie [Evi Moechel]

Our first real contact with 3D graphics was in 1998, the wonderful tool Truespace. Prior to that I still remember – around 1995 -- of a free CD-Rom named “Virtual Reality for Everybody” containing several examples of 3D scenes and 3D graphics viewers.

The following paper only covers 3D Graphics. It does not cover 3D printing software programs nor 3D printers either. It also only covers tools that we once tested – although often 15 years ago.

3D Graphics is not an easy topic and it is “a good idea[1]” to first read some general information such as :

3D Computer Graphics, for basic terminology at least

3D modeling, for the same reasons

List of 3D modeling software, for tools

Comparison of 3D computer graphics software, for tools, capabilities and file formats.

1 Which actually means **mandatory.**

List of file formats to get an idea of the current 3D file format mess – although not worse as regards 3D than in other domains such as for instance Video file formats...

Based on this 3D file format mess, the first (and correct) idea would probably be to get rid of this data format disaster and think about standardization.

VRML, X3D, X3DOM standards

VRML means **V**irtual **R**eality **M**odeling **L**anguage is a markup language (like HTML) created for making ***interactive*** *3D web pages*. The functionalities included in VRML allow for instance making 3D interactive games on the WWW. It was standardized under the name VRML 97 which is still useful.

However VRML has now become obsolete and has been replaced by **X3D** which has become an ISO/IEC (i.e. international) standard. However, most 3D software is still capable to visualize VRML 97 worlds (file extension .wrl).

X3D created by the X3D consortium is hence the applicable standard for making interactive Virtual Reality documents (file extension x3d).

X3DOM is a recent subset of **X3D** that has been created for enabling *plugin-free visualization* of interactive 3D models in modern web browsers (i.e. HTML5 and CSS3 compliant).

DOM stands for **D**ocument **O**bject **M**odel which is the standard web browser internal representation of modern HTML web pages (i.e. HTML5 and CSS3).
See **W3schools** for learning and training about HTML 5 and CSS3.

An important opening achieved in the recent years was the ability to see 3D models and scenes in HTML browsers, without installing additional 3D viewing software on your computer as was the case in the previous years.
While all 3D capabilities are not yet available, at least some have been implemented, allowing artists interested in (interactive) 3D to show their work.

X3D Viewing Tools

FreeWRL allows visualizing VRML and X3D models on your Personal Computer for the 3 major operating systems (Linux, Mac OS and Windows)

X3DOM and **X_Ite** are two different ways of implementing X3D model visualization in a standard HTML5-CSS3 capable browser (i.e. Firefox, Chrome, etc.).

With **X3DOM**, you can see some X3DOM models in your browser here :
https://www.x3dom.org/examples/

With **X_ite** as well. For examples, the web page is here :
http://create3000.de/x_ite/getting-started/

However, the same organisation that created **X_ite** also created an X3D Editor called **Titania**, however for LINUX Ubuntu only...

Libre X3D Modeling Tools

You will find general information on Free and Open Source 3D modelling software here :

https://www.goodfirms.co/blog/best-free-open-source-3d-modeling-software

Wings 3D

Main use : “Wings 3D is open source and completely free for use in both personal and commercial projects”.

Website

Download

Operating Systems : Linux, Windows, Mac OS

Notes : I did not try it recently and it seems to have changed a lot.

White Dune

Main use : Lately I have just been playing again with White Dune which is a German project. *White Dune* ***is not*** *a 3D modeler* but rather a tool for creating interactive 3D worlds, that are compliant with VRML and X3D standards.

Website

Download (same page). For downloading a Windows version you may select the proposed link : **white_dune-1.804 windows 10 64 bit executable**
but there are versions for all 3 operating systems.

Operating Systems : all 3 operating systems.

Notes : The web page is not pretty at all but the tool is rich, rather complete and reasonably easy to use.

Art of Illusion

Main use : “Art of Illusion is Free Open Source software available for Linux, Windows and Mac OS”.

Website

Download

Operating Systems : Linux, Windows, Mac OS,

Notes : However, Art of Illusion has its own file format and only exports VRML files

Blender

Blender is a beautiful very rich and complete 3D editor. But rather difficult to use for beginners.

Commercial 3D Modelers

Bryce 3D

Although it is commercial software and requires buying the tool (about 20 US $) , ***Bryce is probably the best or one of the best choices for beginning with 3D*** .

https://www.daz3d.com/bryce-7-pro

The commercial strategy of DAZ 3D is to sell you 3D models. This is the reason why Bryce is so cheap. However, there are thousands of 3D models on the Internet so it is enough to buy Bryce and see after that if you really need anything else.

Sculptris

Web site

Free, and obsolete. It is meant as an introduction for Zbrush. Nevertheless, funny. Try it !

Zbrush Core

Website

Not free at all

Zbrush

Website

Expensive