How to Design and Build 3D Simulations

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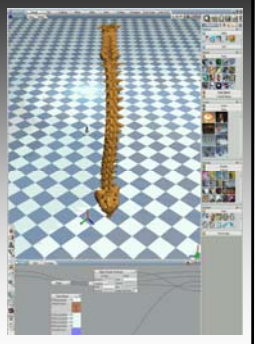
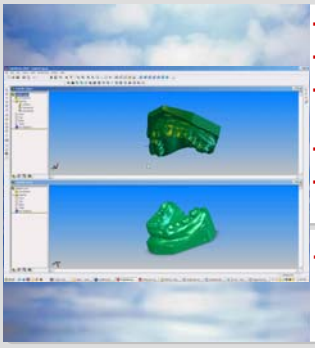


Presentation related material can be found at http://www.ovidiu.ca

Evident visualization of educational concepts



- EVIDENT VISUALIZATIONS OF EDUCATIONALCONCEPTS
- EASY as creating any other type of content from any office type application
- Obvious advantages over schemes in 2D print form that requires too much explanation before the student can visualize the concept being taught.
- Easier method of comprehending complex relationships and interactions.
- Full control over rotation, scale, views, render modes and lighting.

- Methods to set security policies on documents for testing and assessment purposes (authenticate and limiting the time frame or amount of time a document can be opened while offline)

With a policy server each document open and close can be tracked.

Purpose

Ideas about the

- fast integration of 3D objects
- immediate Virtual Reality interaction
- adding interactive 3D (three dimensional) content and rendered visualizations in a wide variety of eLearning scenarios
- scalable reusable 3D content
- easy generation of engaging interactive educational materials

LARGE MARKET OPORTUNITY

Fast and *guaranteed* Rich media delivery to professionals, medical staff, academics, students and extending to biomedical scientists, health care enterprises, patients as well as the public at large.

Of course, by extrapolation, it can be applied to any field.

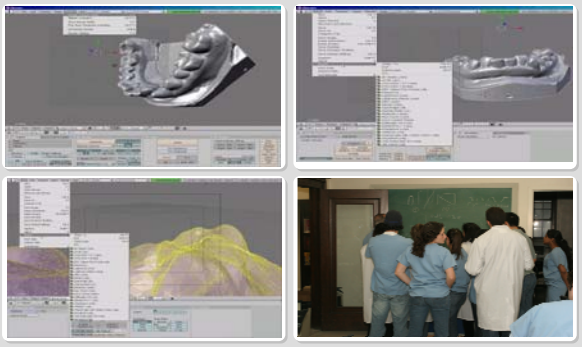
More examples and other uses at http://www.ovidiu.ca

Topics presented

3D Basics	3D Tools	3D eLearning	Blended Future
3D worlds	Acrobat 3D	Flash	FlashLite
3D Modeling	3D scanner	Shockwave 3D	Mobile devices
How to get from 2D to 3D	3D modeling	VRML (obsolete)	OpenGL for mobile devices
	VR distributable documents	X3D (standard but not yet ready)	3D Screens and retinal projection
	Interactive scientific papers	Elearning 3.0 - Platform independent	Real time 3D mLearning
	E-teaching	High Impact 3D presentation	Revolutionize user experience – Real engaging
	Interactive assessments	Distributable VR training	New training methods
		Rich media eLearning	eLearning 3.0

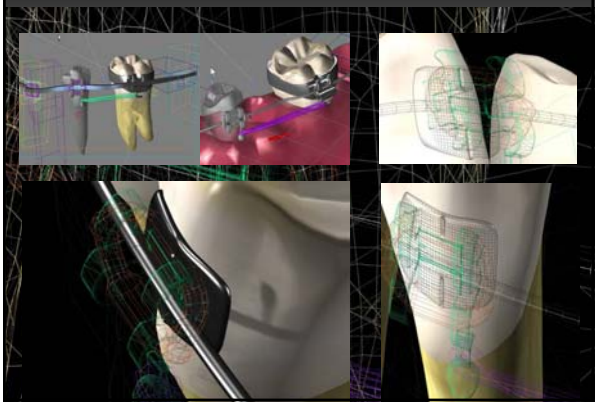
Techology & Demos

3D modeling phase. Blender.org Open Source

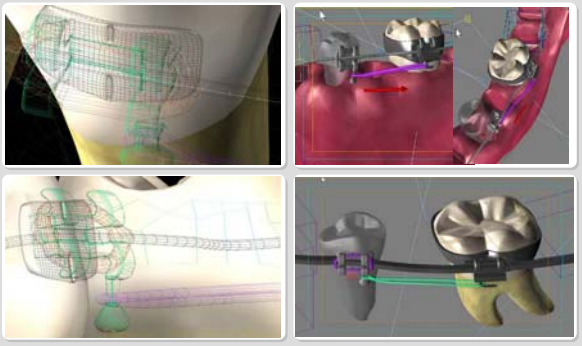


Many good and free 3D modeling programs exist as open source alternatives

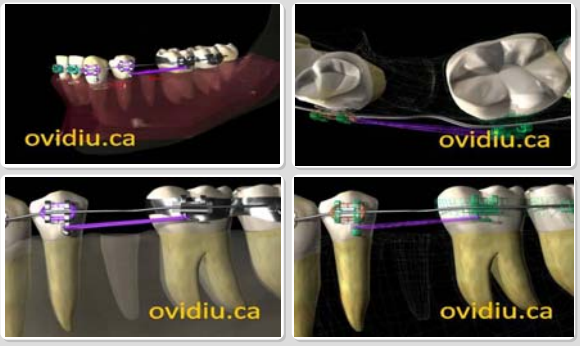
3D Orthodontic Movements Development Phase



3D Orthodontic model development phase



3D Orthodontic Rendered Results



Different views of the same orthodontic movement

Why PDF. Interactive PDF generation

- Is one of the very few formats that is supported by all LMS systems
- The Portable Document Format (PDF) has become the standard cross-platform, cross-application media in which print materials can be distributed electronically. Why not use this huge existing base?
- Ubiquitous format. Government approved, medically accepted, secure policies.
- Additionally, PDF for Healthcare (PDF/H) is an AIIM proposed Best Practice Guide
- PDF 1.7 proposed ISO standard (based on Adobe Acrobat 8) include the newly added format for 3D data

Endodontic series

Implantology series

XPS (XML Paper Specification) in Vista is a static document format - does not include dynamic capabilities similar to those of PDF

Acrobat 3D integration with 3D Hardware & Software

- 3D Scanner

a. Contact (probe)

b. Non-Contact (Active or Passive)

- point clouds produced by 3D scanners are converted into a polygonal 3D model = reconstruction

The National Research Council of Canada was among the first institutes to develop the triangulation-based laser scanning technology in 1978

- 3D CAD
- 3D animations: 3D animations in the U3D format can be embedded in the PDF output. Actions can be defined to interact with 3D animations.

- Acrobat 3D Toolkit - converting CAD documents to PDF objects

- Acrobat 3D
- Optimization controls provide preferences that reduce the polygon count, remove duplicates and apply compression for online delivery

Can capture 3D content from OpenGL applications even from UNIX. Verify that you use the OpenGL driver !

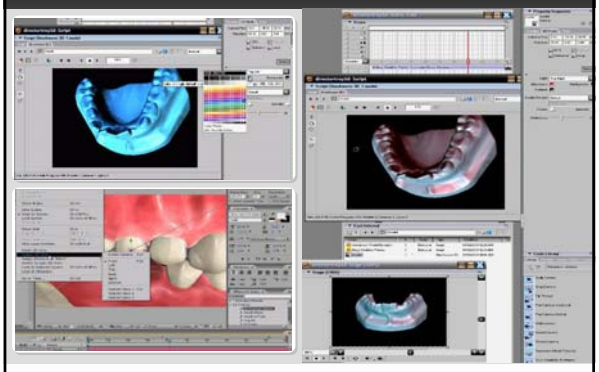
Highly Reusable Content

- Reuse 3D generated material in presentation. animations interactive DVD's, web-based, cell phones delivery, stremed , etc

www.ovidiu ca. www.amberginc.com; www.cyberdent.ca

Reusable Content examples

Director Shockwave 3D - Rich Media Production



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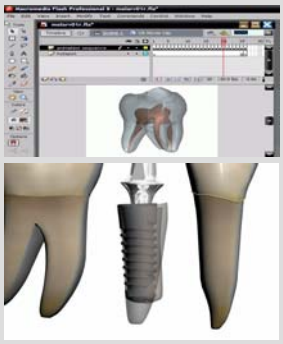
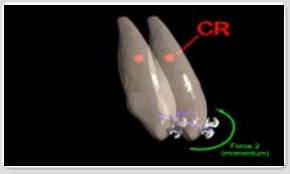
Flash uses for 3D



- Refers to both the player as well to the multimedia authoring program
- …used to create content for the Adobe Engagement Platform (such as web applications, games and movies). The Flash Player is a client application available in most dominant web browsers.
- It features support for vector and raster graphics, a scripting language called ActionScript and bidirectional streaming of audio and video.

FutureSplash Animator by FutureWave Software bought in 1996 by Macromedia became Macromedia Flash 1.0

Delivery – Flash Video - Reusable Content



- Small Footprint
- The use of vector graphics (like PostScript, SVG and PDF) —especially when combined with program code—allows Flash files to translate to small file sizes which take less bandwidth to transmit than bitmaps or video clips do.

- GOOD COMPRESSION
- As of Flash Player 8, it offers two video codecs: On2 VP6 and Sorenson Spark, and run-time support for JPEG, Progressive JPEG, PNG, and GIF
- Avatars

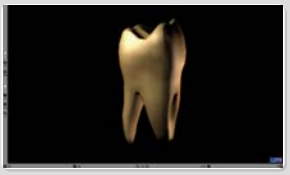
98% of US Web users have the Flash Player installed .
Adobe has announced that it will discontinue support for Adobe SVG Viewer on January 1, 2008

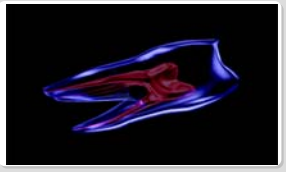
Examples of 3D Reusable Content

- Scientific visualization or eye-catching 3D effects are simple to achieve - but have an amazing effect
- Integrate high-quality, realistic 3D into your Flash elearning material

JAVA 3D, VRML, and Flash Interactive 3D – " THE ZEN "

Sometimes the simplest designs are the most effective.





A minimal interface is all that is required

gameswf is an open source Public Domain library for parsing and rendering SWF movies, using 3D hardware APIs for rendering

High quality 3D Real Time Rendering

- Superb quality 3D renderer
- Fully interactive
- Possibility to integrate high-quality, realistic and engaging content very easily, independent on the platform
- Increased ease of use will **persuade even technophobe staff** to apply and integrate 3D and interactive 3D content in their work and presentations content

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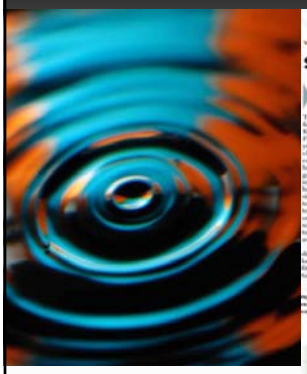
Foreseeable Blended Future



Exploration of elearning 3.0 case examples http://www.cyberdent.ca

Foreseeable Future

- Flash Lite xx: lightweight version of Adobe Flash Player optimized for mobile phones and other devices (PalmOS !) - support the W3C Standard SVG-T (a mobile profile of W3C's Scalable Vector Graphics recommendation)

- Increased ubiquity
- Real device independent and resolution independent content

Adobe Labs (Previously Macromedia labs) is a source for early looks at emerging products and technologies

CONCLUSION : Elearning 3.0 is Here !!!

Spark your imagination. Capture your educational creativity.

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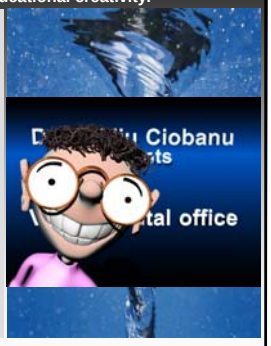

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