

Think in 3D

About

- Cedric Madelaine aka maddec
- Company: <http://analogdesign.ch>
Lab: <http://analogdesign.ch/blog>
- Linked in profile:
<http://www.linkedin.com/pub/cedric-madelaine-aka-maddec/4/5b6/663>
- Started to work on Flash Commercial projects in 1998
- Regular Speaker at the Adobe User Group Geneva

Think in 3D

A new world of creative interactions

- Introduction
- History
- 3D Software & Concepts
- APIS
- Inputs and Outputs
- Tools and Technique
- The Pivot Case
- Conclusion

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Regular 3D Software Challenges

- Create a new vocabulary
- Build new metaphors
- Create UI to manipulate 3D elements
- Invent ways to mimic Real Objects (Extrusion, Mesh, Nurbs, Spline, ...)
- Find computer power to render...

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Real Time 3D History (non exhaustive)

- 1980s Demo scene Amiga & Atari
- 1994 VRML
- 1999 Java 3d
- 2001 Director & Shockwave 3d (Havok)
- 2005 Flash Player 8 (Bitmap and Matrix)
- 2006 Flash Player 8.5 (AVM2) + as3
- 2008 Flash Player 10 and Flash CS4 3D
- 2009 O3D Google

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3D in browser

- Why it has not been successful yet?
 - Required a specific plugin
 - Internet connection speed
 - Computers available
 - Were people ready?
-
- Flash could achieve with 3D what it does with Video.

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Quotations

- "We are rapidly approaching a place where you can deliver gaming experiences in the browser comparable to consoles a generation or two ago," he tells me."
- "Flash is the new console. I call it the next, next-generation."

Raph Koster creator of Ultima Online

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3D Software core missions

- Displays a Live Preview Scene
Rendered Real Time
- Create and Position Primitive Objects
- Modeling: modify/refined Primitives to make them more realistic
- Texturing: apply images to surfaces
- Rendering: Output (image or video)

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3D Software

- Autodesk Maya
- Autodesk 3ds Studio Max
- Autodesk SoftImage XSI
- Lightwave 3D
- Blender (Open Source)
- Cinema4D

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Flash and 3D History

■ 2d fake 3d & Z sorting

- <http://flashloaded.com/flashcomponents/3denvironment/example1.html>
- <http://flashloaded.com/flashcomponents/3denvironment/example2.html>
- <http://flashloaded.com/flashcomponents/3denvironment/example5.html>
- <http://flashloaded.com/flashcomponents/3denvironment/example6.html>

■ Vector 3d exportation: Swift 3d and Swift 3d plugins

- <http://www.tokyoplastic.com/>
- <http://www.tokyoplastic.com/menu.html>

■ Video 3d exportation (Flash 8 alpha channel on2VP6)

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Samples

- Recent:
- <http://www.meintru3d.com/> (Away3D)
- [US Open Golf Tournament](#) (Papervision3D)
- <http://www.whitevoid.com/portfolio.html> (Papervision3D)
- <http://www.barcinski-jeanjean.com/> (Papervision3D)

- Older:
- <http://ecodazoo.com/>
- <http://nitrogroup.com/>
- <http://www.immersivemedia.com/>
- <http://www.papercritters.com/pc.php>

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3D Software Main Concepts

- Viewport
- Scene
- Camera (free or target)
- Primitive Objects
- Materials (Textures)
- Modifiers
- Lightning
- Renderer

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3D and animation

- Frame by Frame
- Tween
- Character animation:
 - Deformation approach
 - Skeleton approach
- Physic

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Real Time vs Pre-rendered

- End User influences content
 - Limited in details
 - End effect depends on the target system
 - Performance intensive, choices needs to be made
 - Require High Optimization
- Ex:
 - Video Games
 - Medical Application
 - Architecture
 - ...
- Everything defined beforehand
 - Ultra Realistic
 - Independant
 - Unlimited Amount of effects and complexity
 - Can be post-produced
- Fields:
 - Movie industry.
 - Advertising
 - Video Clips
 - ...

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Optimisation

- Real Time requires to be careful
- Flash can achieve impressive effects, but it needs to be well balanced
- Skip level of realism when not useful
- Optimisation needs to be central at every stage of development

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3D APIS Introduction

- Started in 2005-2006 Sandy3d & Papervision3D
- Most Famous:
PV3D, Away3D, Alternativa3D, Sandy3D
- Influenced by people behind APIS
- Currently a lot of features are available in 3D Software are possible in 3D APIS
- **Opensource and Commercial** (services scheme)

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3D APIS talk As3

- Kept some concepts from AS3 and transposed them to 3D. Easier to get started
- DisplayObject → DisplayObjects3D
addChild, displayList, etc
- Significant efforts to provide the simplest way to handle operations
- A lot of tutorials and support available

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Papervision3D Intro



- <http://blog.papervision3d.org/>

- Team:

Carlos Ulloa:

<http://www.carlosulloa.com/>

John Grden:

<http://www.rockonflash.com/>

Ralph Hauwert:

<http://www.unitzeroone.com/blog/>

Tim Knip:

<http://www.suite75.net/site/>

Andy Zupko:

<http://blog.zupko.info/>

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Papervision3D Info



- Since: Late 2005
- Actionscript: 2 and 3.
- Website Evaluation: not very clear, need improvement
- Tutorial and samples number: good
- Tutorial and samples quality: good
- Beginner hands-on: easy
- Community: Large
- Marketing: well branded and recognized (Numerous prices with quotation of the brand)

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Papervision3D More



- Vizual PV3d
- Integration:
John Grden Flash CS4 component
- Caneva3d for Flex
- Exclusive related project:
Paperworld3D <http://paperworld3d.com/>
Paperquake ex: <http://www.ascollada.org/examples/quake/lightmap.html>

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Papervision3D Examples



- Samples:

<http://carlosulloa.com/>

<http://www.hbovoyeur.com/>

<http://floorplanner.com/>

<http://bravia.sony.eu/bravia.html>

<http://www.dunross.se/>

<http://taggalaxy.de/>

<http://labs.blitzagency.com/?p=93>

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Away3D Intro



- <http://away3d.com/>
- Team (<http://away3d.com/team>):
- Rob Bateman - <http://www.infiniteturtles.co.uk/blog/>
- Alexander Zadorozhny - <http://away.kiev.ua/away3d/>
- Fabrice Closier - <http://blog.closier.nl/>
- Peter Kapelyan - <http://www.flashten.com/>
- Li - <http://www.lidev.com.ar/>
- ...

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Away3D Info



- Since: Late 2006, started built from Papervision3D branch
- Actionscript: 3
- Tutorial and samples number: a lot of improvements lately
- Tutorial and samples quality: very good
- Beginner hands-on: good
- Community: Medium
- Marketing: recognition in progression, featured on Adobe website
Used by Autodesk for project Dragon Fly
- Drawbacks: features are numerous can be hard to handle by beginners, uses a more flexible model for object creation

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Away3D More



- Integration:
Away3D builder
- Exclusive related project:
GreenPlanet
- Business Model: Away3D Consulting

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Away3D Examples



- <http://www.fifastreet3.com/flash/wk/player.asp>
- <http://www.closier.nl/playground/greenplanet.html>
- <http://www.closier.nl/playground/extrude1.html>
- <http://www.closier.nl/playground/extrude2.html>
- <http://www.closier.nl/playground/facelink/facelink1.html>
- <http://agit8.turbulent.ca/experiments/springcam/>

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Away3D Advanced Features



- <http://www.closier.nl/playground/normalmaps3.html>
- <http://www.closier.nl/playground/pathextrude/path4.html>
- <http://www.closier.nl/playground/normalmaps2.html>
- <http://www.closier.nl/playground/pathextrudetutorials/path animator.html>
- <http://www.closier.nl/playground/smoothtransition.html>
- <http://www.lidev.com.ar/demos/textfieldsmerge/vectorswf/v4/>
- <http://www.closier.nl/playground/normalmaps3.html>
- <http://www.closier.nl/blog/?p=82>
- <http://www.everydayflash.com/flash/walk/>

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Alternativa Intro



<http://alternativaplatform.com>

- Team:
- Anton Volkov
- Alexander Karpovich
- + 10 people

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Alternativa3D products



- Alternativa3D an engine providing 3D-graphics in browsers
- AlternativaGUI window-based interface for interactive browser projects;
- AlternativaCore server solution for gaming and entertainment multiuser media.

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Alternativa3D



- Alternativa3D

<http://blog.alternativaplatform.com/ru/files/2008/01/characterparallax.swf>

<http://blog.alternativaplatform.com/ru/files/2008/04/bunker.swf>

- <http://tankionline.com/index.html>

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Which Engine to choose?



- Very similar because working on same concepts inherited from classic 3D
- Based on Flash metaphors for display
- Each has its particularities

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Other APIS

- WireEngine3D
 - ND3D
 - Five3D
 - Haxe3D
 - ...
- Wick3D
 - FreeSpin 3D
 - Project3D
 - Electric3D
 - ...

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Additional concepts

- Objects Interactivity
- Tweening Animations
- Lightening and effects
- Skybox
- Viewing frustum culling & FPS
- Physic Engines (wow, jglib)

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Why think in 3D?

- Depth and realistic environment out of the 2d page metaphor
- Hard at first because it changes a lot parameters (switch to 3D thinking)
- Think in 3d, go further than 2D concepts put in 3D, but integrate it at conceptual stage
- Use it efficiently and not as an effect

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The Pivot case

- Pivot point definition
- Pivot in 3d APIS is not Object in itself
- Can be confusing at first because:
cannot be manipulated in isolation
- Always centered in PV3d
- Demo and Explanation:
<http://analogdesign.ch/blog/uploads/swf/pivot3d/>

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Inputs & Outputs

- .as AS3GeomExporter (Blender and 3dsMax)
- .dae Collada (all main 3d software)
- .3ds Tim Knip Papervision3d 3ds parser
- .ase Ascii Scene Export Doom3: static meshes
- .md2 ID software Quake 2: player models and static models in maps
<http://www.papervision3d.org/demos/md2/DemoMd2.swf>

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Demo

- Using as3geomexporter and papervision3d.

<http://seraf.mediabox.fr/showcase/as3-geom-class-exporter-for-3ds-max-english/>

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When 3D APIs goes software

- Swift3D
<http://www.erain.com/Products/Swift3D/>
- Vizual PV3D: demo
- PV3D Component for Flash (John Grden)
- VizualPV3D
- Alternativa3D Builder

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Flash CS4 and 3D

- Native management of Triangles 3d
 - More Native methods
 - Pixel Bender and Perspective correction
 - Waiting the GPU support... (Hardware acceleration)
-
- Alternativa3D Flash 10 branch
 - Away3D Flash 10 Branch
 - PapervisionX

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Useful additional Apis

- Go Asap Animation Platform by Moses Gunesh:
Hydrotween3d: Donovan Adams
Go3d: John Grden
- Jiglib Physic Engine
- WOW Physic Engine based on APE
- Flar Toolkit

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3D Optimisation Techniques

- Level of details (LOD)
- Texture Baking
- Mipmapping
- Hidden Surface Determination

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Samples

- <http://www.therelapse.com/>
- <http://www.bananacafe.com.br/>
- <http://www.redbull.com/flightlab/>
- <http://www.coketeens.com.br/promocao/>
- <http://lab.mathieu-badimon.com/>
(portefolio)
- <http://blog.zupko.info/?p=76> (effects)

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Conclusion

- 3D APIS available opensource
- Understand the basic concepts and start exploring
- A lot of functionalities already available opening a new world for creation
- Better performances to come with Flash Player 10 ports of 3D APIS
- Be creative and use Real Time 3D push boundaries of flat web.

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References to start

- Official Websites of each engines
- Forums + Lists
- <http://www.everydayflash.com/blog/>
- <http://blog.tartiflop.com/>
- <http://www.allflashwebsite.com/article/seamlessly-combining-2d-and-3d-in-flash-with-planes-part>

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- Flex Lab Berlin:
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- Carlos Ulloa (Papervision3D)
- Rob Bateman (Away3D)
- Alex Karpovich (Alternativa3D)

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THANK YOU

- THANK YOU
- Workshop follow-up
<http://analogdesign.ch/blog/>