

Universal 3D File Format

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ViewerVR

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Why U3D?

- ▶ Acrobat Reader displays it
- ▶ Use 3D content in your presentation (Show Rio3D.pdf of Sascha)
- ▶ No time consuming editing after export
- ▶ Or use Tim's Presentation Maker (coming soon :-))
- ▶ It's complete
- ▶ It's relatively easy to write

Industry is excited too

“U3D, and its support within mainstream software like Adobe Acrobat will revolutionize Product Lifecycle Management (PLM), taking 3D modeling outside of the traditional barriers...”

Hitachi Consulting

“U3D is an important step in advancing productivity in the digital office. Unlocking rich, 3D content creates opportunities for new uses and new products based on intelligent documentation, ...”

Intel

U3D File Format

- ▶ Binary File Format
- ▶ Standardized by ECMA in 2005
 - ▶ Proposed by 3DIF (3D Industry Forum)
 - ▶ NVidia, ATI, Adobe, Fraunhofer, Intel, ...
- ▶ Approx. 200 pages specification

U3D Features

- ▶ Scene Graph
 - ▶ Fully referenced (lightweight nodes)
 - ▶ Transformation for each parent node
- ▶ Geometry
 - ▶ Face Set (level of detail)
 - ▶ Point Set (quantized/compressed data)
 - ▶ Line Set
- ▶ Materials / Shaders
 - ▶ Standard material properties
 - ▶ Textures included as PNG or JPEG files
 - ▶ Up to 8 texture channels
 - ▶ Sphere maps (no cube maps)
- ▶ ...

Geometry

Point Set

Line Set

Face Sets

Not yet supported

PointSet

ViewerVR

ViewerVR

TODO Liste

- ▶ LineSets
- ▶ Vertex Colors
- ▶ Emulate face normals with per face vertex normals
- ▶ Translate Attributes like `FACE_DRAW`, `VERTEX_DRAW` to node visibility
- ▶ Export Attributes `SPHERES_DRAW`, `TUBES_DRAW` as geometry?
- ▶ Labels
- ▶ ...

U3D jReality Exporter

	jReality	Acrobat 8 Win	Acrobat 8 Linux	Acrobat 7
Geometry				
FaceSet	X	X	X	X
LineSet		?	?	?
PointSet	X	X-	X-	-
Attributes				
Vertex Colors		?	?	?
Vertex Normals	X	X	X	X
Face Normals	-	-	-	-
Material				
Amb/Diff/Spec	X	X	X	X
Texture2D	X	X	X	X
SphereMap	X	X	X-	-
Lights				
Directional	X	X	X	X
Point	X	X	X	X
Cameras				
Clipping	X	X	X	X
Animation				
Key Frames		X-	X-	X---

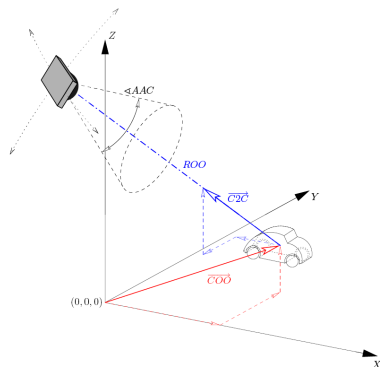
Latex Package movie15

---- ViewerVR.tex Input File ----

```
\includemovie[
mimetype=model/u3d,
autoplay,
poster,
controls=false,
text=ViewerVR,
label=viewerVR,
3Daac=60,
3Dcoo=0 0 0,
3Droo=60,
3Dc2c=-1 0 0.2,
3Droll=0,
3Dlights=Headlamp,
3Djscrip=u3d/ConstrainCamera.js,
3Dviews=u3d/viewerVR.views
]{ 4.2in }{ 3in }{u3d/viewerVR.u3d}
```

---- viewerVR.views View File ----

```
[Default View]{0 0 0}{-1 0 0.2}{60}{0}{60}
[Opposite Side]{0 0 0}{1 0 0.2}{60}{0}{60}
[Left Side]{0 0 0}{0 1 0.2}{60}{0}{60}
[Right Side]{0 0 0}{0 -1 0.2}{60}{0}{60}
```



Acrobat 3D Javascript API

Show the `ContraintCamera.js` Example

Tools for Linux

`u3dpdf` Convert u3d to pdf

`u3dview` Display a u3d file in acroread

Lunch!