Lecture 6: 3D Modeling and Tools

September 12, 2019
OBJ Format - Review

Wavefront .obj file

From Wikipedia, the free encyclopedia

For other uses, see Obj (disambiguation).

OBJ (or .OBJ) is a geometry definition file format first developed by Wavefront Technologies for its Advanced Visualizer animation package. The file format is open and has been adopted by other 3D graphics application vendors.

The OBJ file format is a simple data-format that represents 3D geometry alone — namely, the position of each vertex, the UV position of each texture coordinate vertex, vertex normals, and the faces that make each polygon defined as a list of vertices, and texture vertices. Vertices are stored in a counter-clockwise order by default, making explicit declaration of face normals unnecessary. OBJ coordinates have no units, but OBJ files can contain scale information in a human readable comment line.

**OBJ geometry format**

<table>
<thead>
<tr>
<th>Filename extension</th>
<th>.obj</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet media type</td>
<td>text/plain</td>
</tr>
<tr>
<td>Developed by</td>
<td>Wavefront Technologies</td>
</tr>
<tr>
<td>Type of format</td>
<td>3D model format</td>
</tr>
</tbody>
</table>

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1 File format

1.1 Geometric vertex
1.2 Parameter space vertices
1.3 Face elements

1.3.1 Vertex indices
1.3.2 Vertex texture coordinate indices
1.3.3 Vertex normal indices
1.3.4 Vertex normal indices without texture coordinate indices
1.3.5 Line elements
A Nod to CS410 History
New (to me!) - 2018

Blender Conference 2018
SOLD OUT. See you in October!

Open Source 3D creation. Free to use for any purpose, forever.
Interface makes PhotoShop looks simple 😞
Why Blender Now?

• You will want a way to view and compare 3D models stored in wavefront OBJ format.
• Blender can do this easily
  – Like buying a jeep for the seat – but …
  – .. Blender is now solid on Mac, Linux, Windows
  – Other options really are not, e.g. SketchUp
• Also … as we move through the semester
  – Many concepts will now be ‘visible’ in Blender
    • Camera, Materials, Lights, etc.
Blender Intro Goals 1

• Basic 3D navigation

• Three button mice and hitting the ground
  – I don’t mean hitting the ground running
  – I just mean hitting the ground (ouch)
  – It takes practice to simply manipulate the view

• Practice, having a good view is worth it!
Blender Intro Goals 2

• Load one – or two – OBJ files
• Move objects in ‘world’ coordinates
  – See results in OBJ file
• Edit faces and watch output in OBJ file
  – Start making sense of what is in these files.
• About triangles
  – What does it mean to represent a face
Blender Intro Goals 3

• A complementary view of camera modeling
• There is a camera (of course) in Blender
• It can be manipulated
  – So many ways to place the camera
  – Let us consider only one – match user view
• Camera used to render 2D views of a scene
• A consumers view of rendering
Blender and CS410 Expectations

• Expertise using Blender itself not a goal
  – Questions about using Blender not on exams

• Blender basics almost essential
  – You can view and build models many ways
  – But it is hard to imagine something better

• Key concepts illustrated with Blender
  – Both in lecture and then possibly on exams

Blender is new to CS410. My first impression of capabilities are positive.
And this matters … Blender looks like a lot of FUN!