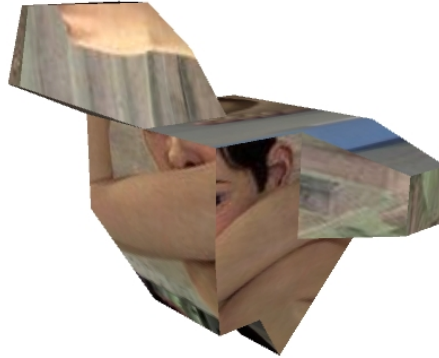


Flattening a Polygonal Model with *Pepakura*



N.B. Pepakura runs only on Windows. Pepakura is shareware. Cost of normal version is \$38. Cost of hires version is an additional \$98. See <http://www.tamasoft.co.jp/pepakura-en/> . Texture image used in this tutorial is a photograph of Ron Mueck's "Boy" sculpture.

In Maya:

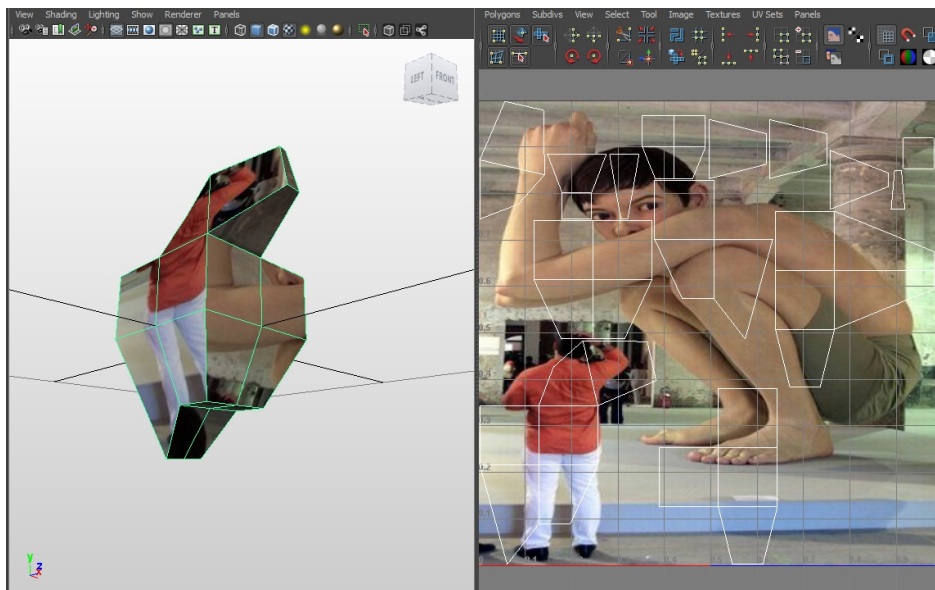
Create a polygonal model

- In *Maya*:
- >Window >Settings/Preferences >Preferences
 - Settings: Set your Linear dimensional units
- Create a polygonal model
 - using any combination of modeling tools
 - (See the Modeling tutorials on this website for more help)

Optionally, Add a Texture

- Skip this section if you are not adding a texture
- If you want to add a texture....
- (See the Rendering tutorials on this website for more help)
 - Select your model
 - >Polygons >Polygons >Create UVs
 - >Automatic Mapping
 - or some other choice
 - This creates mapping "coordinates"
 - This must be done before you attempt to assign a texture
 - Select your model
 - RMB over model
 - >Assign New m\Material
 - Select Lambert, Phong, or Blinn

- In the Attribute Editor...
 - Common Material Attributes
 - Color: Click on checkerboard icon to right
 - >File
 - Image Name: Folder icon to browse to find your picture file
 - Warning:
 - *Pepakura* can accept only .jpg and .bmp texture files
 - (There is no documentation to this effect)
 - Test in Maya by rendering
- If you wish, adjust placement of texture with
 - >Windows >UV Texture Editor
 - Warning:
 - This window is a pretty complex
 - There are very many precise placement possibilities



Scale and Dimensions

- >Create >Measure Tools >Distance Tool
 - to get the Height of your model
- Best to snap to vertices at top and bottom of mode
 - “v” key = snap to point
- In Channel Box,
 - change X and Z values of one locator
 - to match the values of the other locator
- Result: you have measured exact distance from top to bottom
- Optionally...
- Make your two locators and distanceDimension children of your model
 - >Window >Outliner
 - MMB drag locator1, locator2, distanceDimension
 - on top of your model
- Now if you scale your model,

- the dimension measurement scales with it
- **Export your Model as OBJ**
 - >Window >Settings/Preferences >Plug-in Manager
 - Make sure *objExport.mll* is turned on
 - Select your model
 - >File >Export Selection []
 - File type = OBJexport
 - File Type Specific Options = all On
 - This writes an .obj file (the geometry)
 - As well as a .mtl file (a “material” file, which describes the material
 - and also points to the texture file)
 - Pepakura will need to be able to find your:
 - .obj, .mtl and .jpg files
 - Copy them to whichever folder you prefer

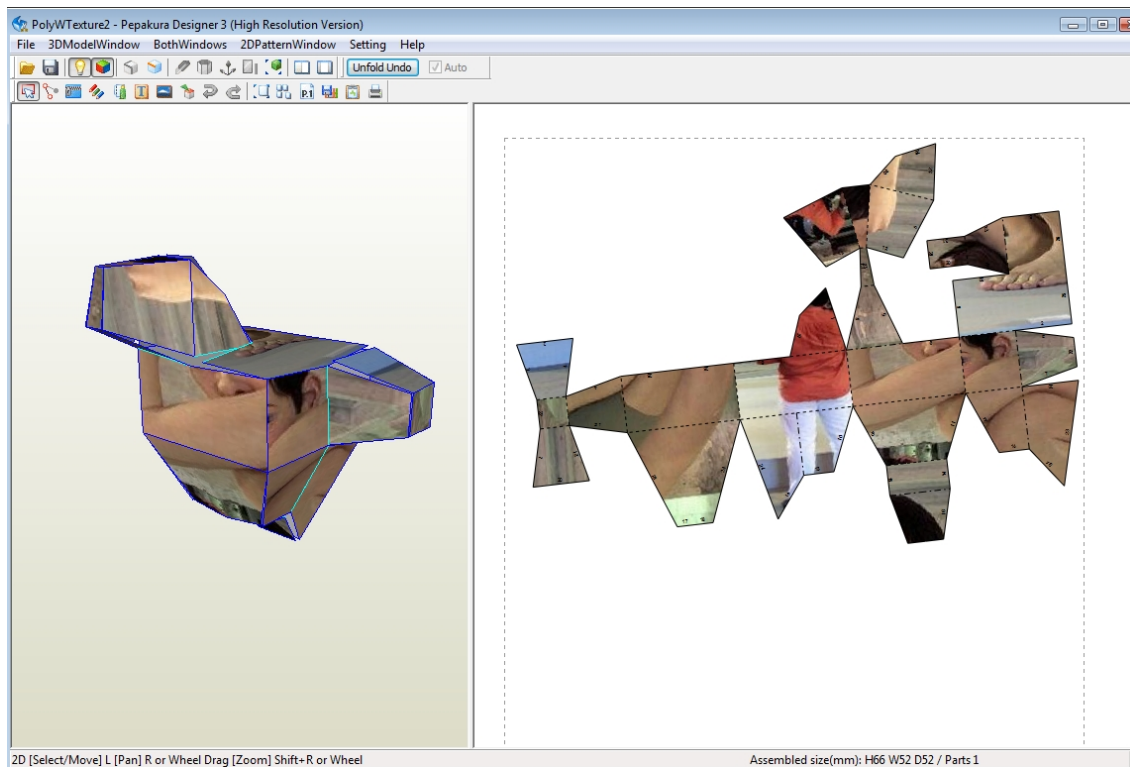
Run Pepakura

- Three of the machines in room 4E7 have the Pepakura software:
 - the teachers workstation
 - and the two machines closest to the windows
- Pepakura runs only on Windows, so...
- Open a virtual Windows window:
 - In the Dock, click on the *Virtual Box* icon
 - ?????
- Double-click Pepakura icon to run it

In Pepakura:

Open and Flatten your model

- In *Pepakura...*
- >File >Open
 - Browse and click on your .obj file
 - OK; No Flip; Finish
- Alt + RMB to look at your model
 - >Unfold
 - This gives you a default unfolding
 - You can adjust the way things unfold later
 - Pepakura calls the unfolded pattern a “development”



- >2DPatternWindow
 - Show Flaps on or off
 - Show Edge ID
 - to number the edges
 - (Very helpful for complex models)

Pepakura: Scale and Dimensions

- Pepakura only works in millimeters (mm)
 - and it does not automatically convert from one unit to another
 - (e.g, from inches to mm)
- So...
- Back n Pepakura:
- >2DPatternWindow
 - > Change the Scale of Development >Specify the Scale
 - Change the *Scale* number
 - until Height in mm is correct
 - E.G., if inches = 37.24, mm = 945.87
 - Pepakura opens model at *Scale* = 0.550846
 - Change that to 10.0 to get correct scale
 - If you want to make a scale model
 - rather than an actual size object
 - Change *Scale* accordingly
 - E.G., Instead of 10, change it to 1
 - to get a 1:10 scale model

Pepakura: Paper Size

- >Setting >Print and Paper Setting
 - to change size of paper
- The Development is automatically spread out over the required number of sheets

Pepakura: Modify the Unfolded Pattern

- To rearrange patterns:
- >2DPatternWindow >Edit Mode
 - >Joint/Disjoin Face
 - Click on edge (highlights in green) to disjoin
 - Click on edge (both highlight in red) to join
 - >Select and Move
 - >Rotate Part

- to get parts into sheets of paper

Pepakura: Textures

- >Setting >Texture Setting
 - to replace one texture with another
 - e.g., a lores with a hires
 - or even a completely different image

Pepakura: Save and then Export

- >File >Save As
 - This saves a Pepakura file
 - This contains the model + the unfolded development

- >File >Export
 - If you do not have any textures,
 - you can export either
 - >Vector Format
 - or
 - a BMP file

 - If you DO have textures,
 - You must export a BMP (bit-mapped file) file

 - **WARNING!:**
 - For BMP files
 - resolution you choose affects final size of model.
 - :-(!!!!!!!
 - I think dpi = 80 gives you correct dimensions?

Import data into Illustrator or Photoshop

- Open your exported file into Illustrator or Photoshop
- Confirm your measurements
 - In Illustrator:
 - >Edit >Preferences >Units....
 - Set to mm

- Measure a section
 - LMB over Eyedropper tool, >Measure tool
 - Click, Drag, Click
 - **TIP:** If Pepakura exports an EPS file,
 - the dimensions in Illustrator are accurate (I think)
- In Photoshop:
 - >Edit >Preferences >Units....
 - Set to mm
 - Measure a section
 - RMB over Eyedropper tool, >Ruler tool
 - Click, Drag, Click
 - GROAN! -- dimensions depend on dpi you used
 - when you exported from Pepakura

Build a Paper Model

- Print out your development/pattern on paper
- Cut it out
- Fold it up

Other Materials

- To build your model of thicker material
 - -- for example, foamboard or wood --
 - many other issues become involved
 - E.G., angle of cut along each edge
- Bad News: Process becomes much more complicated
- Good News: You can build using any flat-surface material you want