Solid Models & Texture Mapping

Paint Jobs for Alice (on a Mac)

This tutorial requires access & installation AC3D 6.5 for Windows or Mac.

You will also need AutoDesk Maya 2011 for Windows or Mac.

Painting of the Models in this Tutorial requires access to AutoDesk Mudbox 2011.

Alice 2.2

This tutorial also requires access to Alice 2.2 for Mac or Windows.

SPIRIT

Solid Modeling & Texture Mapping for Alice 2.2

This tutorial was written by Travis East for the SPIRIT program at Purdue University. The process outlined in this tutorial was developed in collaboration with Mr. Raymond Hassan with the Purdue University Computer & Graphics Department. Mr. Hassan is a Clinical Assistant Professor, specializing in 3D Animation. The content is provided to teachers and students to help simplify the process of texture mapping solid models. This particular version of the tutorial purposefully avoids using AutoDesk 3DsMax as it is only available for Windows.   It is assumed that if you downloaded this tutorial, you are an avid Mac person who is willing to pay good money to avoid using Windows. Unlike all the other tutorials on my webpage involving tutorials for Alice, this is the only one I have posted that cost money to educators. While you can use AC3D 6.5 for 14 days on a trial basis, if you plan to implement this process past that window, you will be spending some money. For students & educators, the cost exceeds that of simply downloading the educational version of 3DsMax. However, at less than $100 for a single license of AC3D, it is much less than purchasing the commercial version of AutoDesk 3DsMax. I would suggest trying the tutorial with the 14 day trial version (full working version) and then decide if owning the software is worth avoiding the Windows environment.

This tutorial is not intended for individuals who are planning a career in solid modeling or texture mapping. It is for teachers who want to quickly demonstrate concepts that help bridge the gap between disciplines such as technology, art, and computer programming. Teachers in the educational field use a variety of solid modeling softwares, such as Inventor, Pro/Desktop, Pro/Engineer, SolidWorks, and the list goes on. In addition, there are a variety of 3D resources that have free 3D models available in a variety of formats. This tutorial attempts to provide a workflow that allows setting up solid models for custom paint jobs with the intention of implementing them in Alice 2.2. Now that AutoDesk offers 13 month licenses to teachers and students for all of its products, any educator can implement the workflow illustrated in this tutorial regardless of their budget. Teachers who intend to attempt this tutorial will need to download a total of two programs from AutoDesk's education site. It is located at http://students.autodesk.com. You will have to create a registration to dowload the software. As the programs are very large, you will want to make sure you have a high speed connection before dowloading the 2011 versions of Maya and Mudbox. The software AC3D can be downloaded at http://www.ac3d.org. If you have questions or issues, you can contact Travis East at teast@nhj.k12.in.us.

Good Luck,

Travis East

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## Summary of WorkFlows Into Alice 2.2

3D Studio (*.3ds)
AC3D (*.ac)
Autocad DXF (*.dxf)
Quake MD2 (*.md2)
Quake3 BSP (*.bsp)
Renderware (*.rwx)
Alias/Triangle (*.tri)
Vector (*.vec,*.r2v)
VRML 1.0 (*.wrl)
Airfoil files (*.sof)
Point field files (*.pf)
LDraw Model File (Lego) (*.ldr,*.dat,*.mpd)
Lightwave object (*.lwo)
Milkshape ASCII files (*.txt)
OBJ files (*.obj)
OFF files (*.off)
Points files (*.pts)
SMF files (*.smf)
STL files (*.stl)
Terragen Terrain (*.ter)

While AC3D can import many different file types, the ones you will likely see used in education are OBJ, STL, DXF, & 3DS.

The only format that will work with Pro/Desktop is STL. However, if you are exporting from a more advanced Solid Modeler, you will likely have other options besides this one.

STL or OBJ → AC3D → DAE → Maya → OBJ → AC3D and Mudbox → ASE → Alice 2.2 / FBX → Texture Map ← TIFF
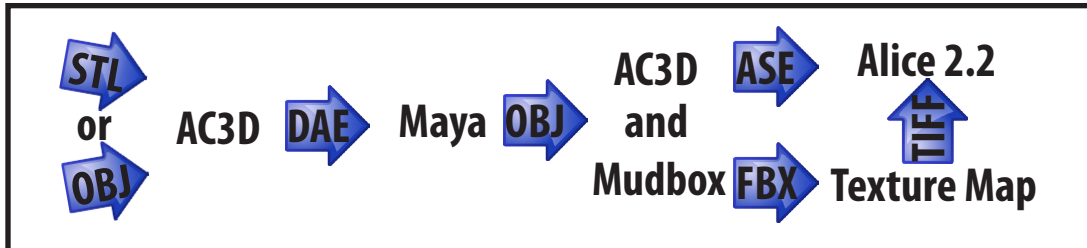
Note - While it is possible to export directly to Maya from a variety of solid modeling software using the STEP (.STP) format, I don't recommend doing this. Even the newest version of Maya imports fragments of NURBs objects that are not compatible with MudBox.

1 Setting Up the Solid Model

In this version of the tutorial, you will learn a single workflow for importing an existing model you have already designed in a solid modeling software into Alice 2.2 using Mac OS X. There are a variety of solid modeling softwares used in Technology Education programs. These include such programs as Pro/Engineer, AutoDesk Inventor, SolidWorks, Rhinoceros, and many others. In this tutorial, we will be using a file exported from Pro/Desktop, but any software program capable of exporting a STL or OBJ file format should work. Once you have the file, all of the rest of the work can be done without ever booting into Windows to complete the texture mapping. The main aspect of a model that will keep it from working in Alice is the complexity. While this method has been tested using standard parts in several programs, it is unlikely to work with assemblies or models with an extreme number of polygons. You will just have to experiment to find out whether a particular model will work.

This tutorial requires a minimum of three software programs to perform the conversion into a a format that is suitable for Alice. Two of these softwares can be downloaded for free by educators at http://www.students.autodesk.com. The 2011 software is available on a 13 month license so long as educators and students use it for non-commercial purposes. All you have to do is visit the website, create a registration, and download the software. The two software programs you will need to download and install before completing this tutorial are the 2011 versions of Maya and Mudbox. The final software that will take the place of AutoDesk 3DsMax (since it is a Windows only program) will be AC3D. A 14 day trial can be downloaded from http://www.ac3d.org. While it is recommended that all three programs be installed on the same system, it is not a requirement.

> *While there are plug-ins for Maya called ActorX that allow export to the ASE format, they are written for the Window version and will likely not work on Mac OS X. In addition, these plug-ins developed by Epic Games often fall behind in compatibility with the latest version of AutoDesk's software even on the Windows operating system.*

Open the Model in AC3D

To begin, you will need to open a solid model you have already created. In the tutorial, we will be using a battleship that was designed in Pro/Desktop. In order for AC3D to import the file, it will need to be exported to an STL format (Pro/Desktop does not have OBJ as an option). Once you have the file in the proper format, you can get to work booting up your Mac into OS X and getting to work. Open the AC3D software by double clicking on the application icon. If you are trying out the 14 day trial, jut click No when asked if you ar ready to buy.

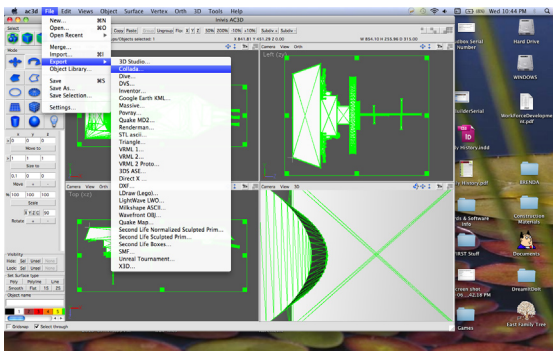# Prepping the Model for Maya

Once the program is open, move your cursor up the File menu and select Import...
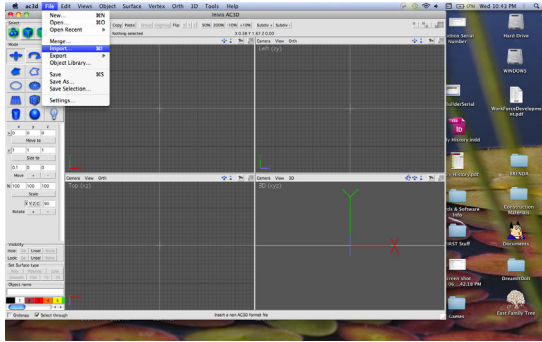
Find the STL file to import & click Open.
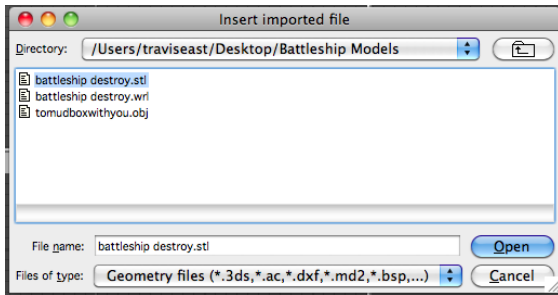
Once imported, move the cursor up the File menu, down to Export, and over to Collada...


The file extension that will be assigned to the file will be a Digital Asset Exchange or .DAE format.

Setting up the Texture Map in Maya

Now, you are ready to open Maya 2011. Maya is the program that will be used to automatically set up the texture maps for you. At the time of writing, AC3D does not have an automatic mapping feature. To ensure that the model imports correctly, you will need to make sure that the import settings for Maya are enabled. To do this, move your cursor to the Window menu, down to Settings/Preferences, and over to the Plug-in Manager.
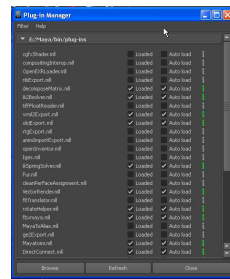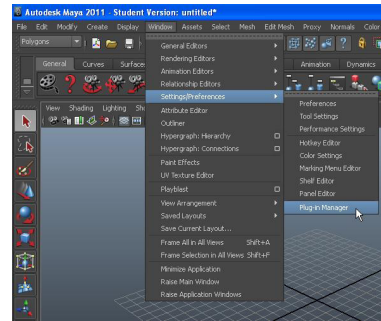
In the dialog box that appears, make sure there are check marks next to objExpor. mll, fbxmaya.mll, & also the DirectConnect.mll to ensure all of the imports and exports work properly. Once you have ensured these are loaded, you can click the "Close" button.

It is now time to import the model into Maya. Move the cursor up to the File menu & select Import...

Your model will have a wireframe appearance until you click "Smooth shade all".
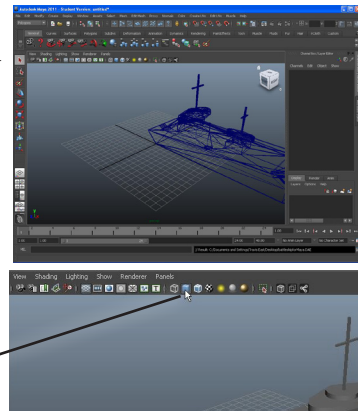
If the model is too large to fit on screen, you can use the Scale tool on the left side of the interface to make it smaller. Once the model is highlighted, you can click and drag on the yellow square at the center of your model. Once it is the size you desire, you can use the "Move" tool to translate the model on the screen where you would like to place it.

Automatic Mapping:

You are now ready to use the automatic mapping feature of Maya. Use the arrow tool in the toolbox to select the model.

Next, move your cursor up to the "Create UVs" menu & select "Automatic Mapping".

You should see squares appear around the model.
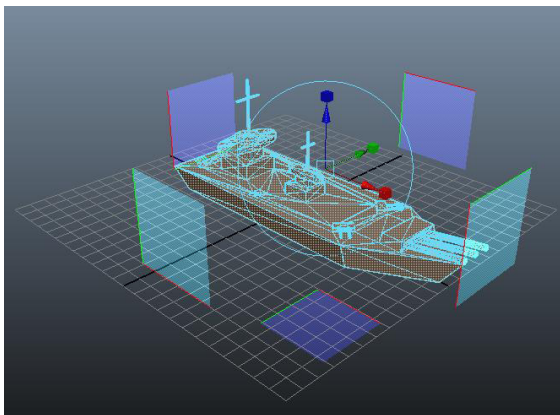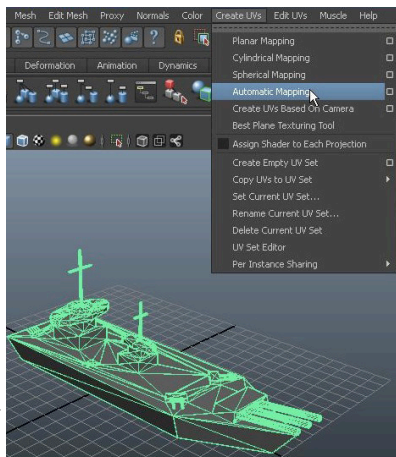
To view the UV map to get a sense of the complexity of your model, move your cursor up to the "Edit UVs" menu and select "UV Texture Editor".
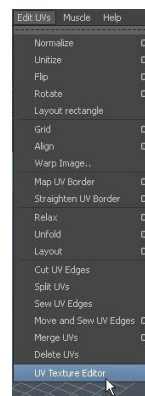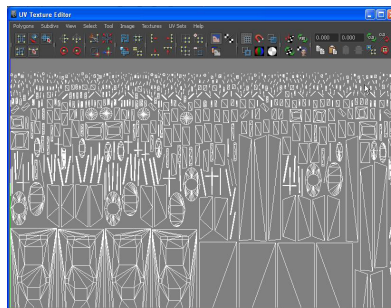
You are now ready to export the texture mapped version of your model to Mudbox 2011. To get the model into Mudbox, you will need to export it as an OBJ file. This OBJ file you export will also later be used to import the textured mapped version of the model into AC3D. To export the model, use the arrow tool in the toolbox to highlight the model if it is not already. Move your cursor up to the "File" menu & select "Export Selection..." Then select "OBJexport" under "Files of Type" Finally, click on Export Selection.
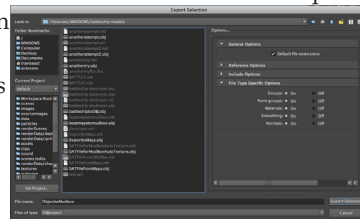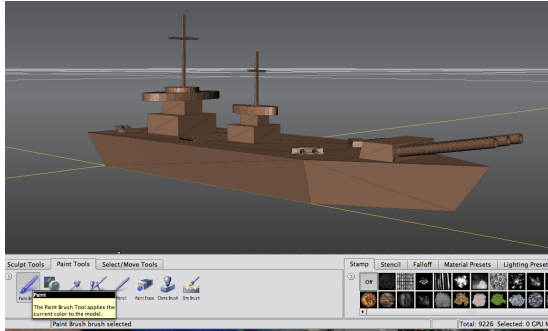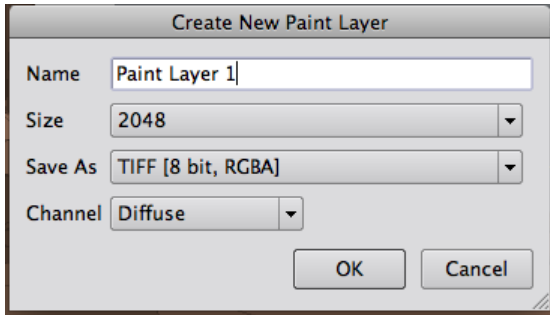
Painting in Mudbox

You are now ready to open Mudbox. You will see a Welcome screen like the one seen here. Click on "Open ..."
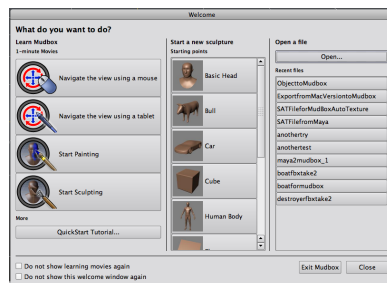
Navigate the directory where you saved the OBJ file. Once imported, click the "Paint Tools" tab.

Select the "Paint Brush" tool and then select a texture you want to use to paint under the "Stamp" tab. Click and drag on one of the faces of your model.

When you do this, a dialog box will appear asking you to create a new layer. Give the layer an appropriate name and then click OK. Begin painting your model on the faces that are toward you. When you need to move the model, hold down the "Option" key on the keyboard, and click & drag the mouse. Holding down the option key and clicking & dragging the right mouse button will pan across the model. Keep going until it is painted.
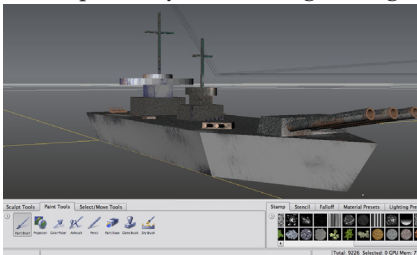
If you have any faces unpainted like the brown spaces on the previous image, those sections will be transparent when you get them into Alice. Option click & drag to rotate around the model to ensure you have every face painted. Once you are satisfied that the paint job is complete, click on the Select/Move Tools near the bottom left side of the screen. Click on the Objects button & then on the model. Once highlighted, your model will change color. With the model highlighted, move your cursor up to the File menu and down to "Export Selection…"

Once the dialog box appears, select FBX as the format & save.

The main reason for exporting the FBX file from Mudbox in this step is to export the TIF file which contains the paint job. We will use the TIF file later when we open Alice. For now, we will be using the OBJ file exported from Maya in AC3D to export to an ASE file. ASE is the file format that is required to import 3D models into Alice 2.2.

Back to AC3D

Because Mudbox and Maya do not export to a format that Alice can import, we will need to open the OBJ file exported from Maya in AC3D before continuing. Open up AC3D and move your cursor up to the File menu in the top-left side of the screen. Click on it and move the cursor down to Import. Find the OBJ file you exported from Maya and click Open.

You are now ready to export the model to an ASE file. To do this, move your cursor up to the File menu in the top-left corner, go down to Export and over to 3DS ASE… Give the file a name & save it.

Ready for Alice

You are now ready to bring the ASE file into Alice and to texture map it with the TIF file from Mudbox. To begin this process, move the cursor up to the File menu in Alice and down to Import... & find the ASE file that you just exported from AC3D.
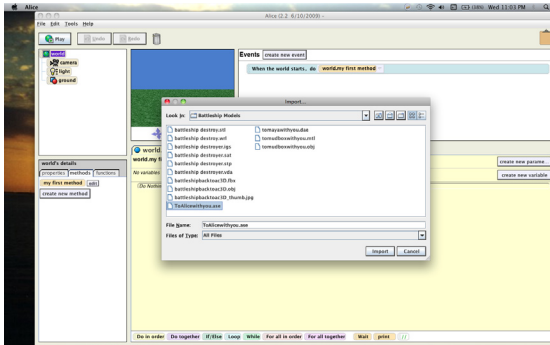

If your model does not have too many polygons, it should import with no issues. At this point, there will be no texture map applied.
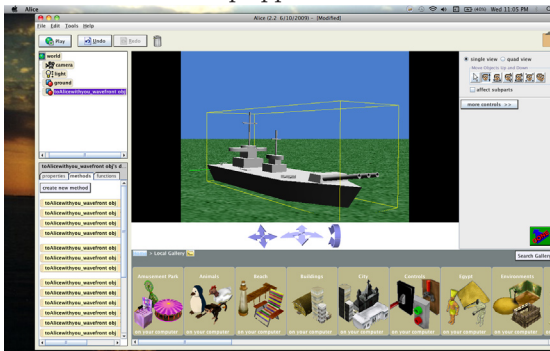
To add the texture map, you will need to use the TIF file that was exported from Mudbox when you saved the model as an FBX file. Recall that when you export FBX files, both the model and a texture map file are created in the same directory. In the next step, you will need to find the FBX file from Mudbox.
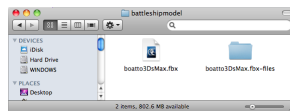

Click on the object and select the Properties tab. Locate the Texture Map setting & click on the + sign to the left of it. Click on the "Import texture map" button & located the TIF file for the model you painted in Mudbox. It will be stored in the same directory as the FBX file.
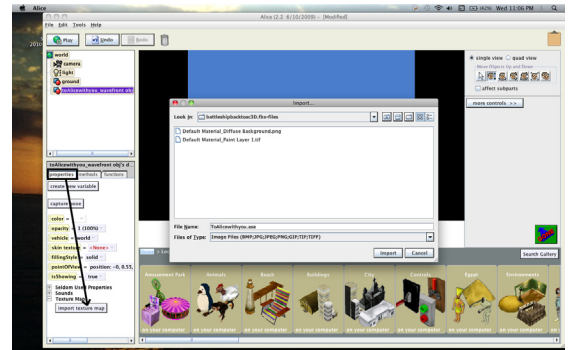
Once the file is imported into Alice, you can now apply the graphic as a "skin texture". The model will have <None> as the skin texture by default in Alice. Once the file is imported, click on the popup menu that says <None>. Select the graphic you just imported. You should now see the painted version of your model in Alice. If there is a color specified under the color setting, you will want to click on the popup menu and select color = <None>.

Congratulations, you have completed the tutorial.
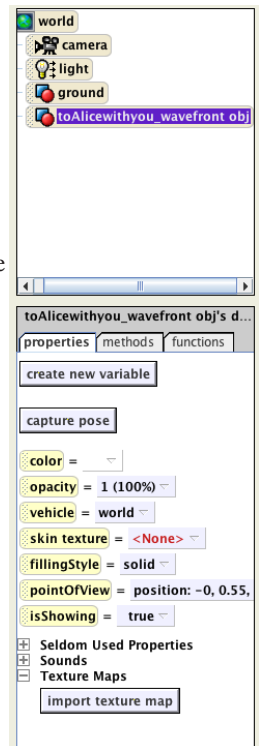
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