

Solid Models & Texture Mapping

Custom Paint Jobs for Alice



This tutorial requires access & installation of Autodesk 3DsMax for Windows.



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.

Solid Modeling & Texture Mapping for Alice 2.2

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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 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. 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 three programs from AutoDesk's education site. It is located at <http://students.autodesk.com>. You will have to create a registration to download the software. As the programs are very large, you will want to make sure you have a high speed connection before downloading the 2011 versions of 3DsMax, Maya, and Mudbox. 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

Model Texture Mapping Workflow

Pro/Desktop 8 **SAT** 3DsMax 2011 **DAE** Maya 2011 **OBJ** Mudbox 2011 **FBX** 3DsMax 2011 **ASE** Alice 2.2

Solid Model Export without Textures

Pro/Desktop 8 **SAT** 3DsMax 2011 **ASE** Alice 2.2

If you have earlier versions of 3DsMax, you may need to use the VRML or IGES formats.

Solid Model Export from Maya

Maya 2011 **OBJ** Mudbox 2011 **FBX** 3DsMax 2011 **ASE** Alice 2.2

Solid Model Export from 3DsMax

3DsMax 2011 **ASE** Alice 2.2

Model Texture Map from Inventor

AutoDesk Inventor **IPT** 3DsMax 2011 **DAE** Maya 2011 **OBJ** Mudbox 2011 **FBX** 3DsMax 2011 **ASE** Alice 2.2

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.

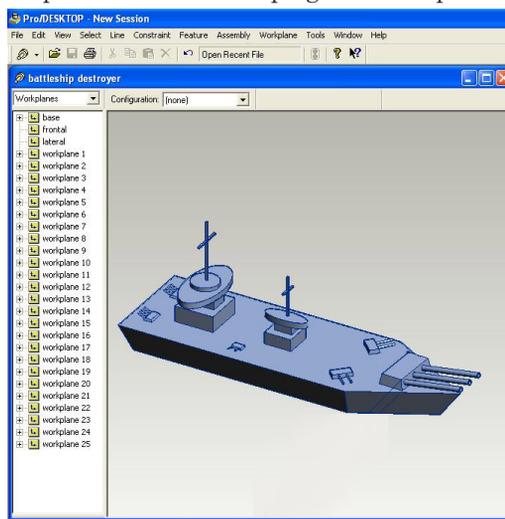
1 Setting Up the Solid Model

In this 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. 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 Pro/Desktop, but any software program capable of exporting a SAT file format should work. The main aspect of a model that will keep it from working in Alice is the complexity. You should try to keep the models as simple as possible. 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.

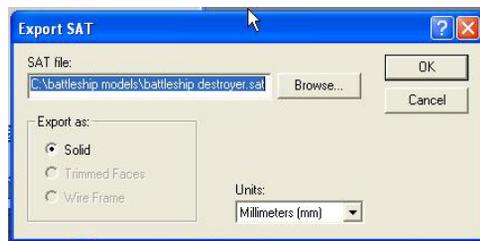
This tutorial requires a minimum of three software programs to perform the conversion into a format that is suitable for Alice. All of these softwares can be downloaded for free by educators at <http://www.students.autodesk.com>. The 2011 software is available on a 13 month license so long as educators 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 three software programs you will need to download and install before completing this tutorial are the 2011 versions of 3DsMax, Maya, and Mudbox. While it is recommended that all three programs be installed on the same system, it is not a requirement.

Export the model to 3DsMax

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. We will open the model in the program and export it.

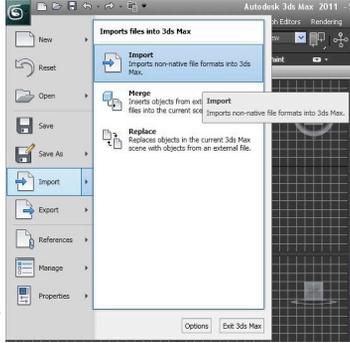


After going up the File Menu, go down to Export and over to SAT file... and click OK at the dialog.

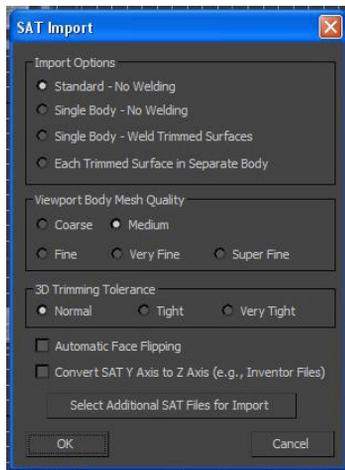


Prepping the Model for Maya

The next step involves importing the SAT file into 3DsMax 2011 to get prep the model for Maya. 3DsMax does a great job of setting up the model into a polygonal surface which works well when we eventually paint the model. To get the file imported into 3DsMax, open the program and go up to the File menu (in the 2011 version, it is just an icon). Go down to Import & over to Import.



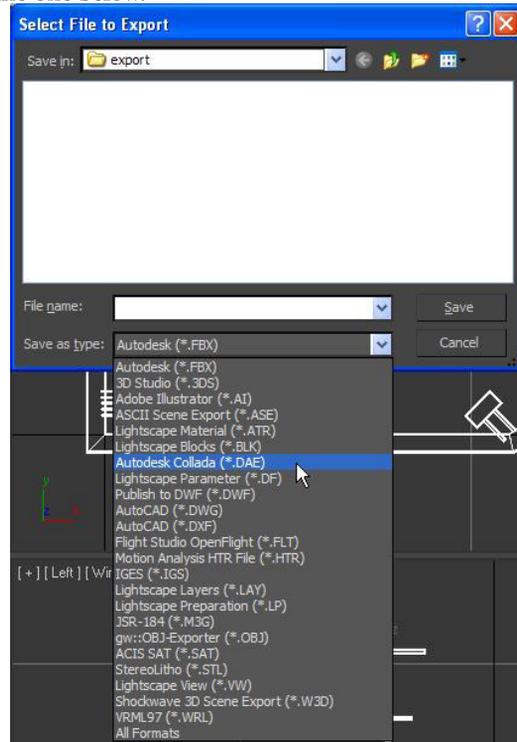
Navigate and find the file you exported from Pro/Desktop (or whatever solid model program you use). Once you have found the file, you will see a dialog box like the one below. If you avoided models that



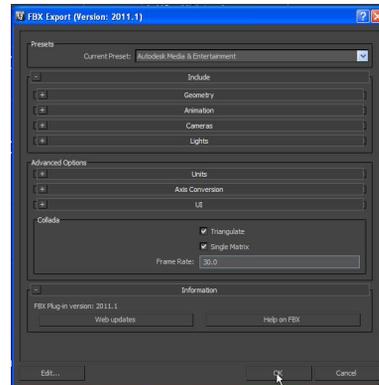
contain assemblies, you can go with the Standard - No Welding default. Also, if your model is simple, you can go with the default Medium quality. However, I would suggest using Coarse Mesh Quality the first time you try this tutorial to ensure compatibility.

When the model imports into 3DsMax, we can immediately export the model into Maya 2011. To do this, you move the cursor up to the 3DsMax icon in the top-left side of the screen, go down to Export

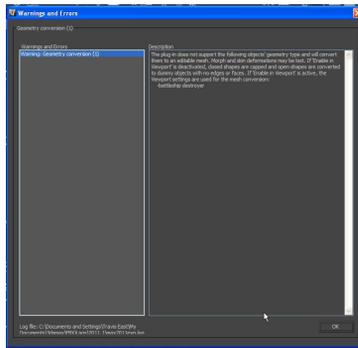
and over to Export. You will see a dialog box like the one below.



Under the “Save as type:” menu, select *.DAE as the format, and then click the Save button. You will see another dialog box like the one below. Note that it is also possible to export to FBX instead of choosing the DAE format. In fact, the export settings for both DAE & FBX are very similar. The reason for choosing DAE is that this format seems to export more seamlessly to Maya.

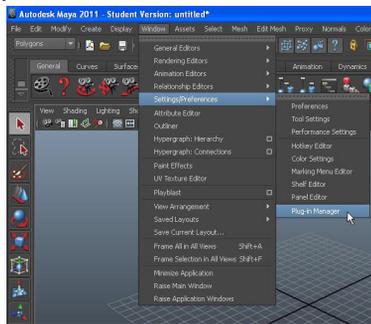


Once you click OK on the dialog box, you will see another window warning you that the model is being converted to an editable mesh. This is perfectly normal and should be expected. Simply click OK to continue on to Maya.

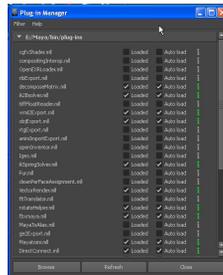


Setting up the Texture Map in Maya

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, 3DsMax does not have an automatic mapping feature. To ensure that the model imports correctly, you will need to make sure that the import settings

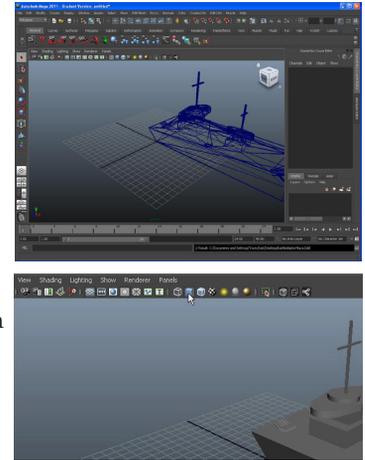


In the dialog box that appears, make sure there are check marks next to objExp.mll, fbxmaya.mll, & also the DirectConnect.mll to ensure all of the imports and exports work properly. Once you have ensured these are loaded, you can click the "Close" button.



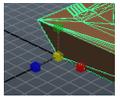
It is now time to import the model into Maya. Move the cursor up to the File menu & select Import...

Your model will have a wireframe appearance until you click "Smooth shade all".



If the model is too large

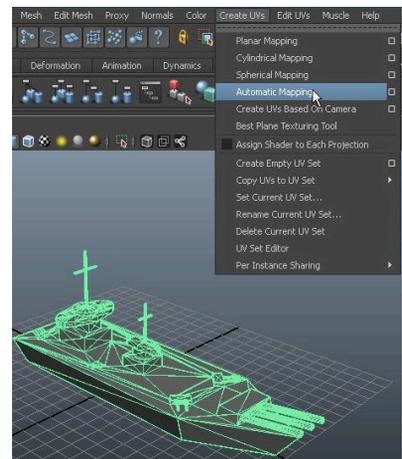
to fit on screen, you can use the Scale tool on the left side of the interface to make it smaller. Once the model is highlighted, you can click and drag on the yellow square at the center of your model. Once it is the size you desire, you can use the "Move" tool to translate the model on the screen where you would like to place it.

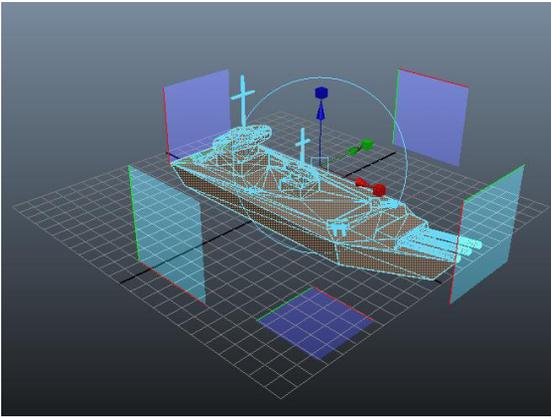


Automatic Mapping:

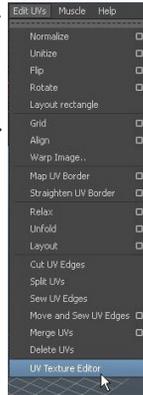
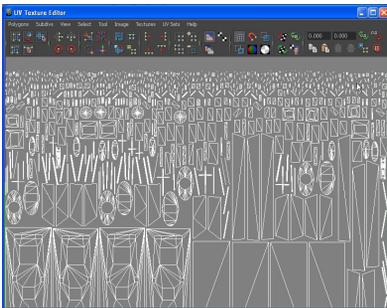
You are now ready to use the automatic mapping feature of Maya. Use the arrow tool in the toolbox to select the model.

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



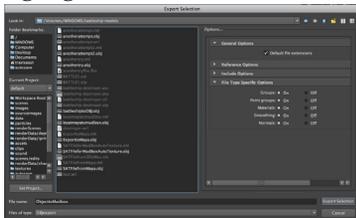


To view the UV map to get a sense of the complexity of your model, move your cursor up to the “Edit UVs” menu and select “UV Texture Editor”.

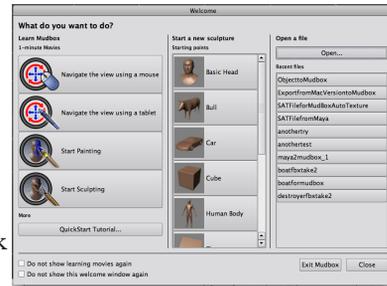


Painting in Mudbox

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. 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”:



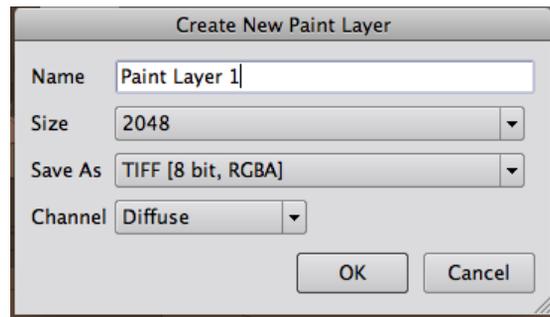
You are now ready to open the Mudbox program. You will see a Welcome screen like the one seen here. Click on “Open ...”



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.

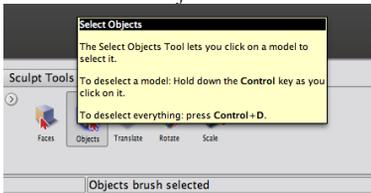


When you do this, a dialog box will appear asking you to create a new layer. Give the layer an appropriate name and then click OK. Begin painting your model on the faces that are toward you. When you need to move the model, hold down the “Option”

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 completely painted.

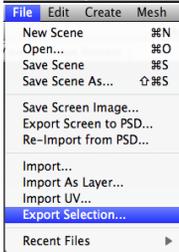


If you have any faces unpainted like the brown spaces on the model above, those sections will be transparent when you get them into Alice. Option click & drag to rotate around the model to ensure you have every face painted. Once you are satisfied that the paint job is complete, click on the Select/Move 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.

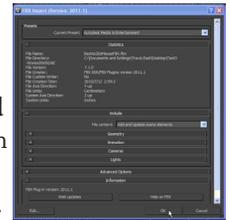
Now that you spent so much time painting your model, it is worth mentioning when you export the

FBX file, there is a file and a folder with the texture files in the same directory created. This is important if you move the files to another computer.

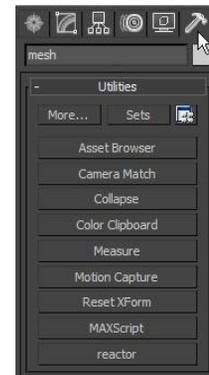


Back to Max

Because Mudbox does not export to a format that Alice can import, we will need to open the FBX files in AutoDesk 3DsMax before continuing. Open up 3DsMax and move your cursor up to the 3DsMax icon in the top-left side of the screen. Click on it and move the cursor down to Import & over to Import. Find the FBX file you exported from Mudbox. You will see a dialog box with some import settings. Just click OK.

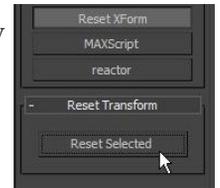


With the model highlighted, move your cursor over to the tab that has a hammer as an icon near the far right-hand side of the screen and click on it. Find the button that says Reset XForm and click on it.

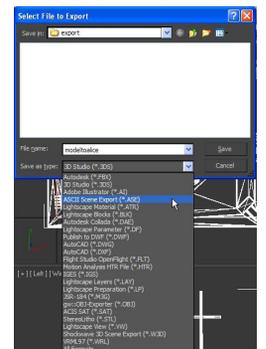


Next, click on the Reset Selected button.

You are now ready to export the model to an ASE file.



To do this, move your cursor up to the 3DsMax icon in the top-left corner, go down to Export & over to Export. Once you see the dialog box, select ASE under the Save as type menu. Use the ASCII settings seen here.

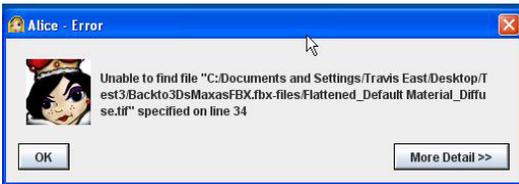


Ready for Alice

The time has come to import the model into Alice 2.2 as an ASE file. Once you have opened Alice, move the cursor up to the File menu and select Import...

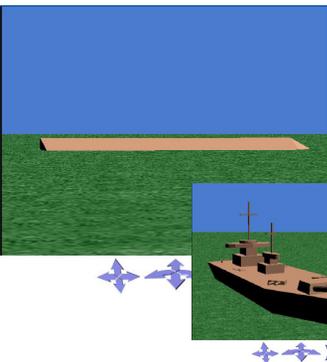
Find the directory that you saved the ASE file and click Import.

You may get an error message.



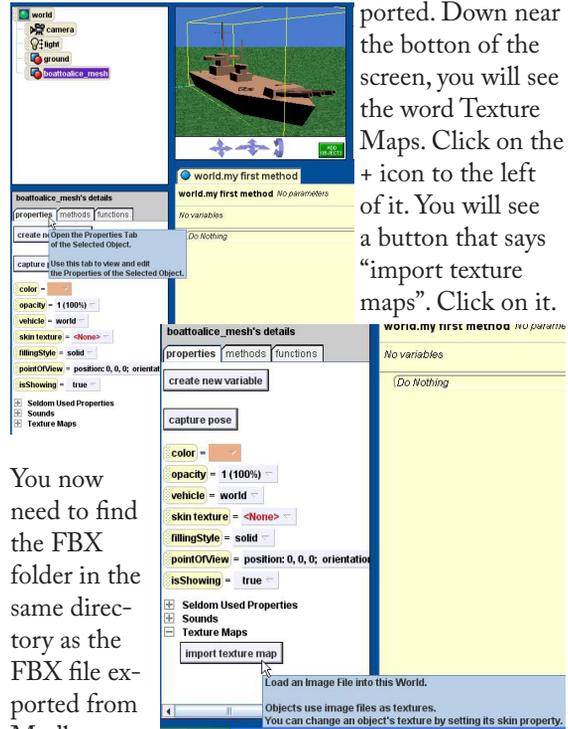
This error message is especially likely if you exported the ASE file to Alice on another computer. The final step of this tutorial shows you how to apply the texture in the event that it does not automatically transfer over to Alice.

To make the model look the way you predicted, it may also be necessary to click the green Add Objects button so that you can adjust the position of your model on screen.



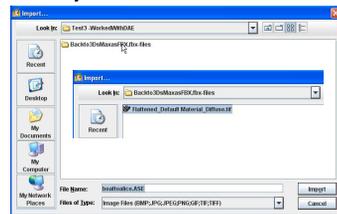
You can experiment with the Tumble Objects buttons until the object is easy to see.

Once you position the model on screen how you like, click on the Properties tab of the one you imported.



You now need to find the FBX folder in the same directory as the FBX file exported from Mudbox.

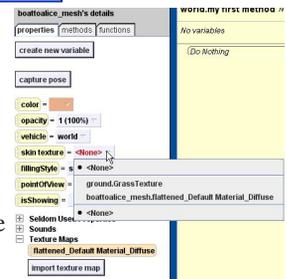
Once you have found the TIF file, click on it. It will



appear below the import texture button. The final step is to click on the menu that says "skin texture=<None>".

Select the name of the TIF file from the FBX file. The model will then have the paint job you created in Mudbox.

Congratulations, you have completed the tutorial.





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