Hello and welcome to the Ficus Editor!

Ficus is a new game engine built by Ficus Game Studios for our next upcoming game. Please keep in mind while using this guide, the editor is still in development, and not all features may work as intended or have even been implemented yet. Some features may have changed by the time this guide was last updated as well.

This small document should help you find your way while using the tools so far and give you some insight as to what can be used as of now.

// The Ficus Game Engine and the Ficus Editor are copyrighted tools by Ficus Game Studios//

FIRST TIME SETUP

If you have not already, please follow this guide to creating your working directory.

Simply load up the Ficus Editor.exe from the Ficus Editor directory. Since this is the first setup so far, your Root Directory will be set. Essentially, this allows Ficus to find all files inside the Assets folder, which should be inside of your Ficus Editor directory. This handles many things, specifically the location of the other folders inside of Ficus Editor, such as the shaders the engine uses to run and all of the assets used to build our games. Without it, the editor will fail to initialize.

Once loaded, if there are no scenario files inside of your Scenarios folder, Ficus Editor will ask you to name a new scenario. This will automatically generate a new folder inside of Scenario, along with a .scenario file of the chosen name. If you do not have a Scenarios folder inside of the main Ficus Editor folder, create one now.

Once your scenario has loaded, you can now start editing. When you want to save, simply hit save in File->Save. Make sure to always back up your work frequently.

The next time you load up the editor it will prompt you to find a scenario. Simply load an old one. If you'd like to create a new scenario, open a previous Scenario file and go to File->New Scenario. (You'll need to restart Ficus and select the new scenario to load it.)

*IF YOU GET SHADER ERRORS WHEN USING NVIDIA:

This is most likely due to using an integrated graphics card on a laptop or something similar on NVidia. You will need to open your NVidia control panel, go to "Manage 3d Settings"-> "Program Settings", Click Add, choose Ficus Editor.exe, and use "High-Performance NVIDIA processor". Boot it again and see if there as any more errors. You should also make sure Assets/Shaders repository is up to date as well, since the engine uses these to run. If the problem continues to persist, contact Kevin.

THE VIEWPORT

1. CONTROLS

W, A, S, D - Movment keys

T - Top down view

Middle Mouse - Hold this down to look around while your mouse is inside the viewport

V - Toggle's Speed for the Camera

Ctrl - Down

Space - Up

F1 - Toggles Wireframe Mode

F2 - Toggles Frustum Culling

F3 - Toggles Normal Mapping

F4 - Toggles Specular Mapping

F5/F6 - Toggles between alpha rendering modes (best to leave this as default, which is F5)

2. LEFT HAND TOOLBAR

#1 Pointer - Disables the transformation gizmos

#2 Transform - Enables transformation gizmos

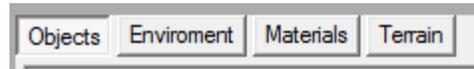#3 Scale Modifiers - Enables scaling of objects

#4 Grid tool - (Does not yet work) Toggles grid mode

#5 Lighting tool - (Does not yet work) Toggles lighting   *(The left hand toolbar)*

3. TABS   *(The four main tabs)*

These are the main sections covered in this guide.

- Objects – placement of game objects, such as scenery.
- Environment – Allows you to edit environmental settings such as fog color and density.
- Materials – Lets you view Physics Materials and also create and edit Render Materials used on objects and terrain layers.
- Terrain – Terrain editing tools such as landscape modifiers and terrain texturing.

OBJECTS

1. ADDING OBJECTS

To start adding objects in Ficus, there are a few things to note that Ficus uses currently:

- Objects are exported as .ASE files. You need the following checked as well when exporting from 3ds Max: Mesh Definition, Materials, Mesh Normals, and Mapping Coordinates.
- Ficus finds and reads the texture files from wherever you selected them in 3ds Max's material editor. Make sure that the texture files are on the SVN, so that everyone may use them. For best practice, make a textures folder inside the objects folder and put all relevant textures there. The same can be done for Models and Physics (Collision meshes)
- If you have multiple variations of a sinlge object, they can all be stored in the same folder.
- LOD's must be placed in the same folder as the original object. How to create LOD's and use them are listed under the Global Properties section on page 5.
- Always export from 0,0,0 (this is where the gizmo is located in 3d space) and use a height reference.
- Ficus only can read TGA file formats. Alpha maps MUST be 32 bit and ones without a texture map must be 16 bit.
- To use normal mapping and specular mapping for a specific texture, you must use the prefixes _norm and _spec at the end of each of the relative files. They do not need to be linked in 3ds Max, only the diffuse must.

|			
rock_sharp.tga	12/31/2013 2:44 PM	TGA File	769 KB
rock_sharp_norm.tga	3/9/2014 8:48 PM	TGA File	769 KB
rock_sharp_spec.tga	3/1/2014 10:10 AM	TGA File	769 KB

(Normal and Specular map set up in relation to base texture map)

Now, to add an object, you must go to Objects->Palette in the right hand area. Here you can make a new category for your items. Once you have made a new category, select it, and hit "Add

Scenery". A dialog box will open that will allow you to select an .ASE file within your assets directory.
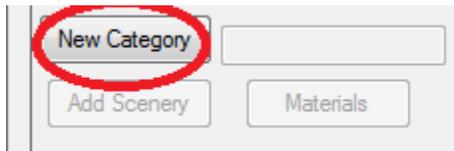
 (Select new category, type the name and hit enter)
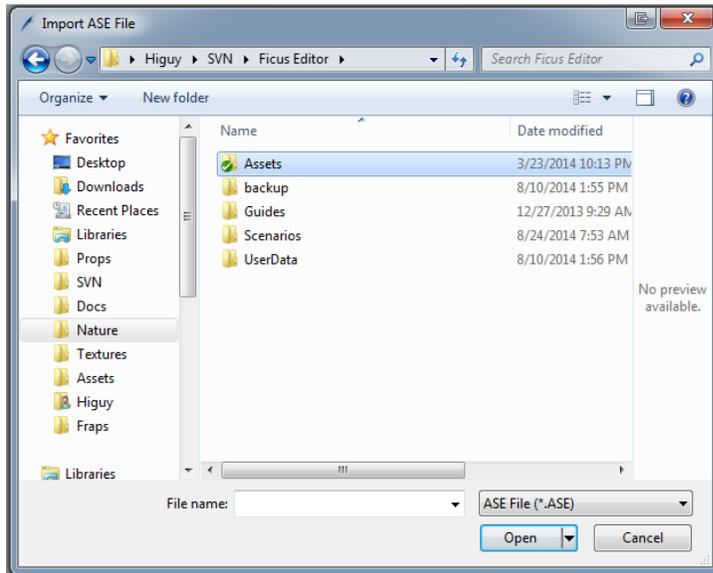
(Finding an object in the assets directory!)

Once opened, expand your category and select the object. You can now right click in the viewport to add instances of the object. To transform objects, use the gizmo inside of the viewport. You can also manually transform them using the instance properties, located on the right hand side.
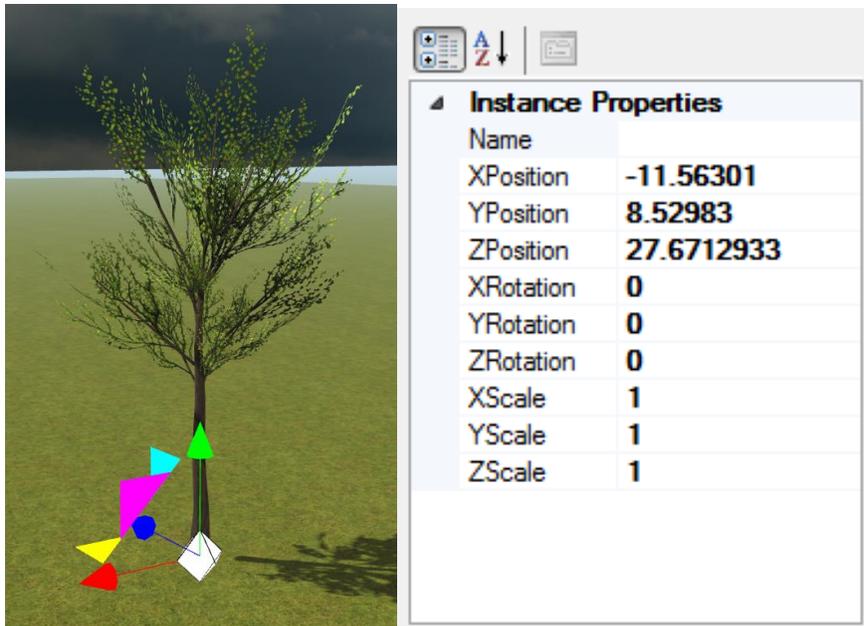
(Left: The transform gizmo, located at the base of the tree. Right: Manual transformation and other instance properties)

The scenery editor gives you a wide range of tools to edit your objects properties, such as LOD Ranges, Bend Factor (sways things in the wind), Collision meshes, dynamic objects, Physic Materials, Render Materials, and so forth. You can also name your object to keep better track of it and also use them for scripting in the future.

2. GLOBAL PROPERTIES

Listed here are the general global properties of a scenery mesh added to the palette.

- Bend Factor: If this is greater than 0, then the mesh will sway in the wind. Usually a value around 0.007 works great for trees – a larger number like 0.04 is good for smaller vegetation such as grass. Play with the values to see what looks realistic to you.
- Instanced Mesh – Tells the editor to render all the instances of the specified mesh in a single draw call. This is good for objects such as grass, where it is rendered in high volume.
- Cast Shadows – Toggles the casting of shadows for objects.
- LOD Properties – This controls the distances used for LOD switching. Excluding the original imported mesh, LOD1 is the highest and LOD3 is the lowest. You also have the availability to use the Cutoff Distance, which will simply stop rendering the mesh at the specified distance you are away from it. To use LOD's, you must create the models and place them in the same directory as the original imported file. To specify which LOD is which, use the prefix _LOD1, _LOD2, and _LOD3.
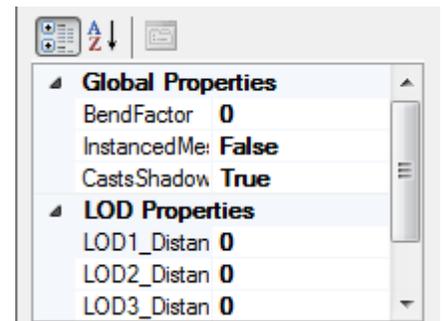
grass_patch_thick.ASE	3/9/2014 10:00 AM	ASE File	72 KB
grass_patch_thick_LOD1.ase	7/24/2014 11:56 AM	ASE File	26 KB
grass_patch_thick_LOD2.ase	7/24/2014 12:06 PM	ASE File	11 KB
grass_patch_thick_LOD3.ase	7/24/2014 4:21 PM	ASE File	9 KB

(Example of LOD setup in the objects models folder)

3. PHYSICS PROPERTIES

Listed here are the general physics properties of a scenery mesh that you are given.

- Physics Material Type: This sets the objects density, friction, and restitution. While the editor comes with a few to choose from, you can easily make your own by opening Ficus Editor\UserData\Physics\physics.xml and adding a new material in it. Simply reboot the editor afterward to see the new material in the drop down box and select it.
- Collison Mesh: Here you can link your object to a specific collision mesh. We recommend that in your objects main folder, you create a separate folder called Physics to keep better track of the collision meshes for your object. Keep in mind that both the rendering mesh and Collison mesh need to be in the same coordinates in 3ds Max space when exported, or they will not line up correctly.
- Dynamic Object: Enabling this option will make your object dynamic, meaning that it can now move around the level and be interacted with other objects. It will be affected by gravity and other forces.
- Swept Sphere Radius: This gives this continuous collision detection within a certain radius of the object. This is not recommended for general use, but rather if you have issues with much smaller objects moving at higher velocity's, as it could be a potential fix.
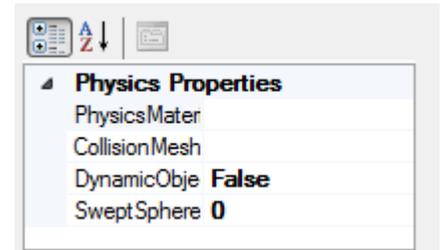
4. INSTANCE PROPERTIES

Listed here are the instance properties. An instance is an object that can be used multiple times. When you transform an object you placed on the ground, you are editing an instance of that object.

- Name: You can set a specific name for the object which can be used to find a specific instance fast and also can be used for scripting in the future.
- XYZ Position factors: This is the location of the game object in 3-D space relative to 0,0,0.
- XYZ Rotation factors: Measured in radians, you can rotate the instance on any given axis.
- XYZ Scale factors: This allows you to change the size of any object. 1 is the default size on any axis.
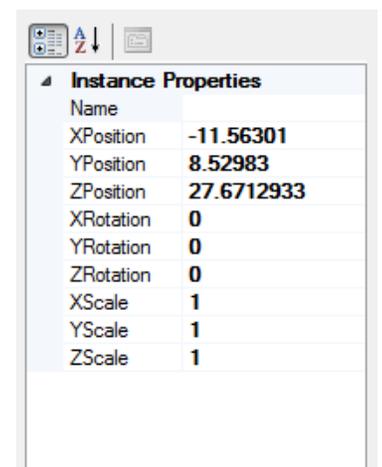
5. OBJECT SETTINGS

Ficus Editor gives you some settings you can change when placing objects. These settings are located in the settings tab under the Objects tab.
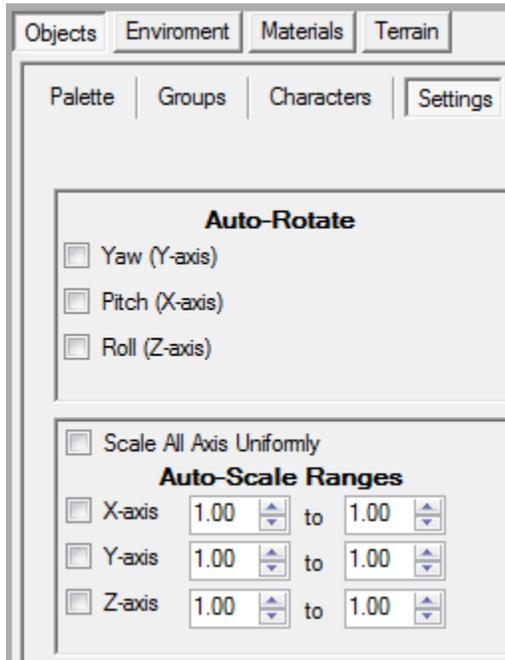
(Settings that can be changed and where this tab is located)

- Auto Rotate: If checked, the editor will randomly rotate on the given axis when the object is placed. Yaw (Y-Axis) is the vertical axis. Great for vegetation.
- Scale All Axis Uniformly: If checked, will keep all proportions the same when scaling objects.
- Auto-Scale Ranges: If checked, the given axis will randomly change size when placed on the given axis with the ranges set.

ENVIROMENT

1. FOG SETTINGS

Fog settings are controlled by color and density. Upon initial load up of the editor, this will be blank. Select a good color matching the horizon of the sky or a color (in RGB format) that fits your scene and a density.

MATERIALS

1. PHYSICS MATERIALS

This tab under Materials allows you to select a pre-defined Physics Material and view its properties without opening up the XML file. Stated previously on page 6, you can create new ones and edit these by opening Ficus Editor\UserData\Physics\physics.xml and adding a new material in it. Simply reboot the editor afterward to see the new material in the drop down box and select it.
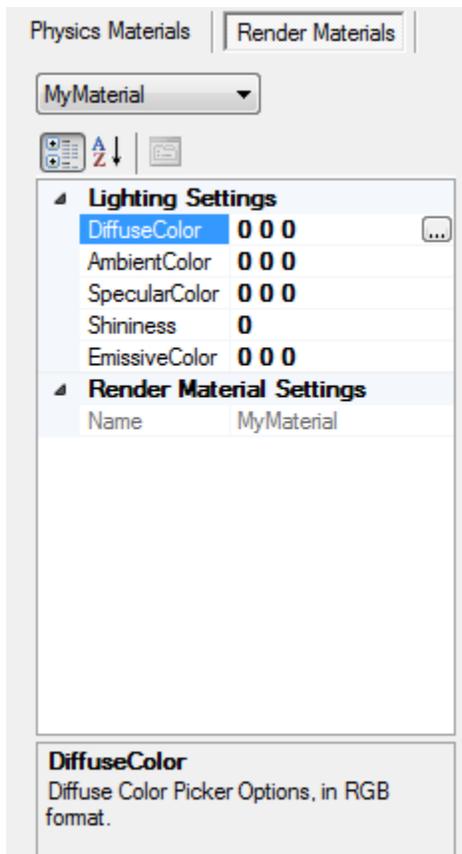
2. RENDER MATERIALS

Render materials are a very handy feature included in Ficus. They allow you to edit color values of textures, Specular Colors, how shiny they are, and an emissive color. These materials, like Physics Materials, are stored in an XML file in Ficus Editor\UserData\RenderMaterials which means that materials can be used across all scenarios and also between multiple users. To save your materials you created, simply hit File->Save.

To create a new Render Material, simply click New Material, type a name, and hit enter.

*(New Material button, similar to New Category)*

(Render Material options)

After you have made a new material, you can edit the values.

- Diffuse Color: Changes the diffuse color of the material.
- Ambient Color: Changes the ambient color of the material.
- Specular Color: Changes the color reflected in the specular.
- Shininess: This value controls how shiny the specular map becomes.
- Emissive Color: Great for "glowing" objects. Even in shadow, the object be this color.

3. APPLYING RENDER MATERIALS TO AN OBJECT

Once you have a render material created, you can apply it to a specific texture on an object by going to the Objects tab; select the imported scenery object, and then selecting materials. A new dialog box will open.
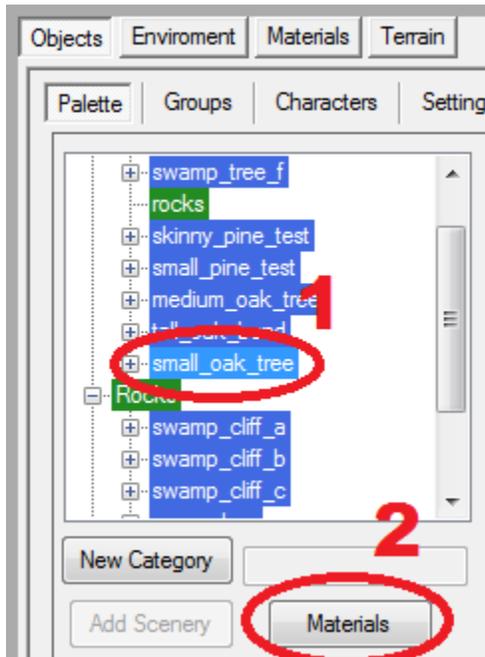
(1: Selected object. 2: The Materials button)
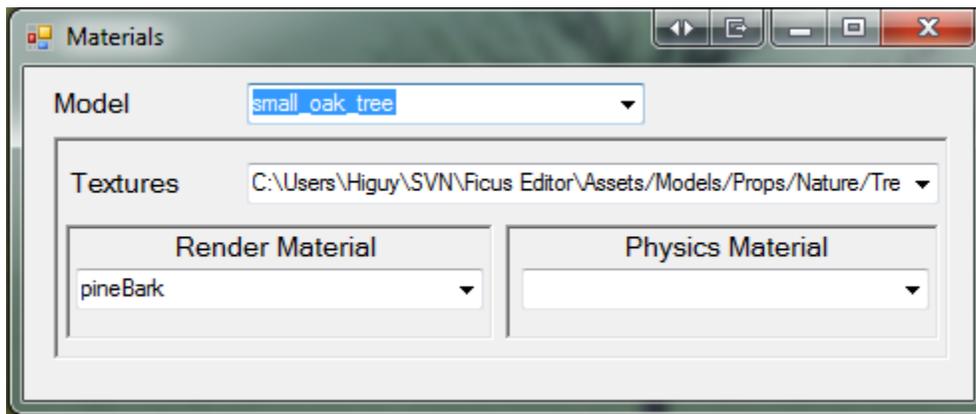
(Render Materials dialog box for objects)

Once the dialog box has opened, you will be looking at a few things:

- Models: The default model selected is the base model. If the object has LOD's, you can use the drop down box to select those too.
- Textures: Given the specified model selected, the textures associated with that model will be listed here. Use the drop down box to see all textures.

- Render Material and Physics Material: For each texture on each model, you can select a render material you created and a physics material.

So for each Texture ID on each individual model, you can give it a material you created. Once the material is applied, you can go back to the Materials-> Render Materials tab and edit the properties, seeing the changes in real time.

TERRAIN

Listed here are all the tabs and options under the Terrain tab in the Ficus Editor.

1. MODIFY

The modify tab allows you to edit the terrain manually using a circular brush and manually set settings.

- Raise/Lower tabs: Raise/Lowers the terrain with the terrain brush values. (Radius, Height, Falloff, and strength)
- Flatten: Flattens the terrain at the height you select with the Terrain Brush. You can edit the size of the brush.
- Smooth: Allows you to smooth any hard edges found in the terrain. You can set the radius and smoothing frequency (higher number = more intense smoothing).

2. LAYERS

Layers allow you to paint textures directly onto the terrain. Including a base map layer, you have 12 total slots in any given scenario to add textures and paint with. The default base layer uses a grid texture.
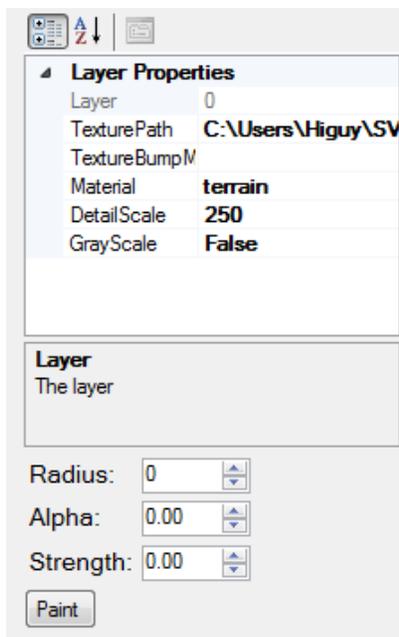
*(Terrain layer options and editing brush)*

- Layer: This simply specifices the exact layer you are using.
- Texture Path: This will open a dialog box for you to go and locate a texture file to use as the diffuse. There are a lot of available textures in Assets\Textures\Nature.
- Texture Bump Map: The bump map that matches up with the texture.
- Material: You must assign a render material to the layer otherwise it will be black.
- Detail Scale: The scale on how much the texture tiles.
- Grayscale: If true, this layer will blend with the base texture map. Great if you are using a 1:1 terrain texture map on the base layer (say to match up with an imported hieghtmap) and want the layer to blend with it.

Brush Settings:

- Radius: How large the terrain painting brush is.
- Alpha: How soft it is (use on scale of 0 – 1.00)
- Strength: When painting, how strong the texture shows up (0 – 1.00 scale).

3. GENERATION

These options allow you to import a hieghtmap, set its scale (strength), smooth the entire terrain (very useful if you imported a hieghtmap) and to also regenerate physics of the terrain.
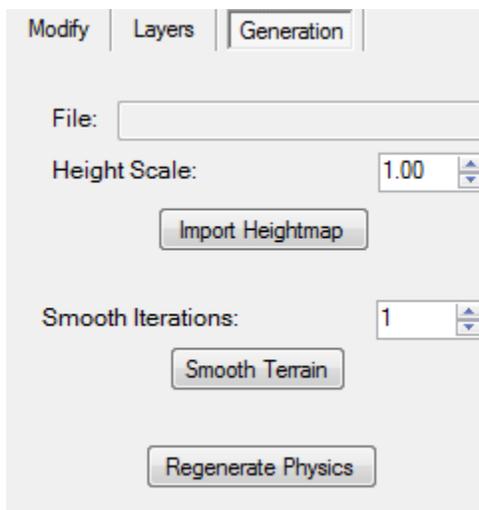
(Terrain generation options)

To import a hieghtmap, simply select "Import Hieghtmap" and locate the correct file. If you are importing a custom made hieghtmap, make sure it's a TGA File, and in RGB color, 8bits / Channel, and 1024 x 1024 (matches terrain).

*Note: the terrain may move up high above the camera after importing; this is normal.

The height scale can be changed after importing, but you will need to select import hieghtmap again. The height scale basically controls the "strength" of the hieghtmap itself, and a higher number will results in a more intense hieghtmap.

Smooth Iterations is much like smoothing frequency from the modify tab, but this will allow you to smooth the entire terrain at once.

Regenerate Physics will allow you to regenerate all of the physics for the terrain. After you edit terrain in any way (except layer painting), you should regenerate the physics. This will make sure that the player and other dynamic objects respond accordingly to the terrain and things render properly.

GAMEPLAY AND GRAPHICAL OPTIONS
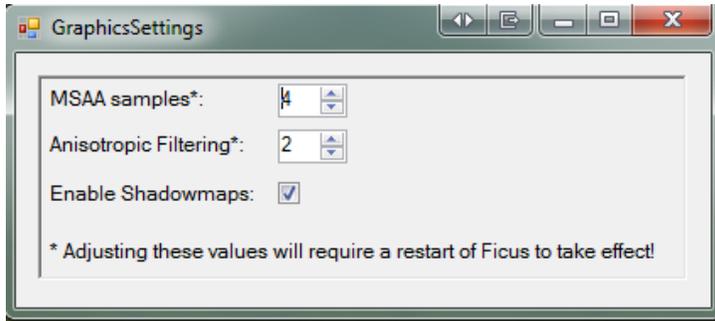
Located on the top taskbar, you will notice "Game".
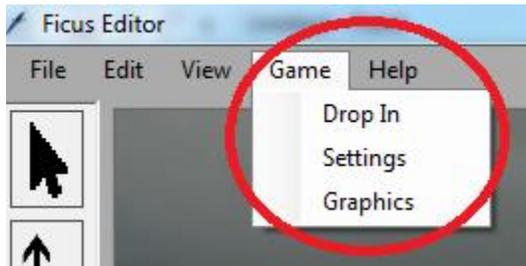
Under this tab, you will find a few options, explained below:

- Drop In: This will drop you in as the player from where the camera is. You will be able to walk around using the same controls as the camera. You can also sprint using shift. To exit this mode, simply hit ESC on your keyboard.
- Settings: These settings affect the walk speed and camera movement of the player controller you use when you "drop in". Edit these values to your liking.
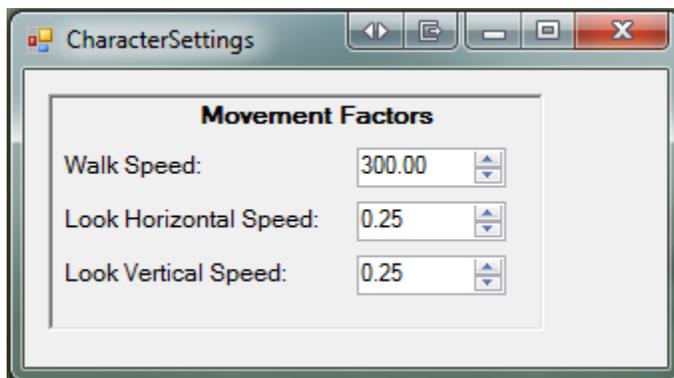
(Character Settings)

- Gtaphics: These allow you to change the graphical settings of the engine. You can change the MSAA samples, Anisotropic Filtering, and Toggle Shadows. By adjusting MSAA Samples and Anisotropic Filtering, you will need to restart Ficus for them to take effect.

(Graphical Settings)