



CINEMA SUITE



USER DOCUMENTATION FOR CINEMA **MO CAP**
DOC VERSION V1.1 – NOVEMBER 2013



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Introduction

Thank you for purchasing Cinema Mo Cap! Our team makes software extensions for Unity that allow game developers, machinimists, machinimators and movie professionals to create and control content for their projects quickly, and easily. More importantly, we want our users to have fun doing it.

Being avid fans of video games and movies, our team set out on a common goal - to create a set of cinematic game and film tools, which are powerful, affordable and available to the masses, through the Unity Asset Store.

Cinema Mo Cap is the first module of our set of tools called "Cinema Suite". Cinema Suite is a collection of software extensions for Unity3D that will allow developers to create content without the need for scripting or programming. Cinema Mo Cap allows you to use your Microsoft Kinect® (and in a future release the Asus Xtion Pro®) to capture simple animations, which you can then use in your Unity project. Animations created with Cinema Mo Cap are fully compatible with Unity3D's Mecanim engine, and are meant to be compatible with any humanoid (biped) character.

Please remember, making great products is only possible if we have feedback from people like you, and our community. Feedback is critical to our success and we welcome it in all forms, be it Facebook, Twitter, Email or our Forums. Please check out ways that you can directly communicate with us, at the end of this document.

Thank you for helping us make Cinema Mo Cap great!

The Cinema Suite Team



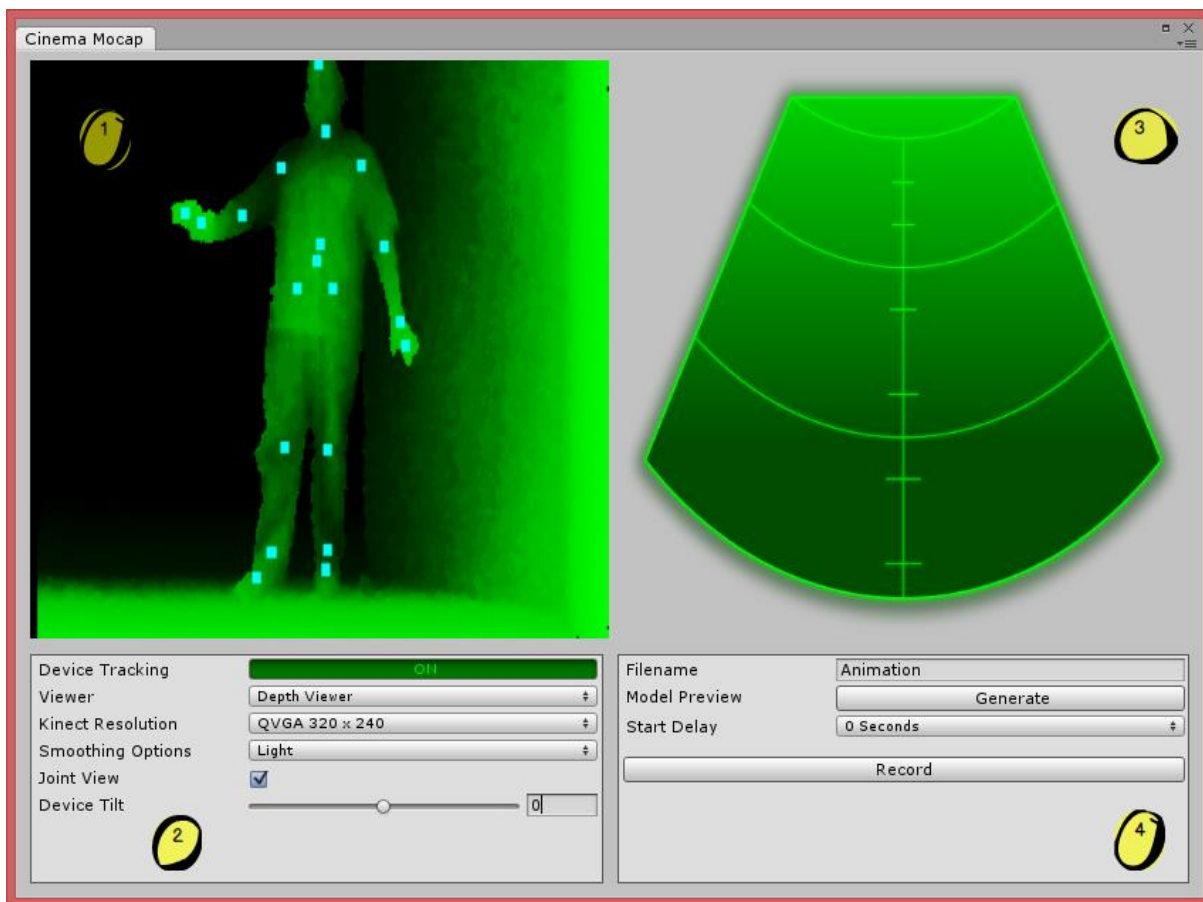
Cinema Mo-Cap Overview

Key Features

- Quickly create animations for Unity3D, using the Microsoft Kinect®.
- Control Options for Kinect® such as resolution and tilt.
- Automatic animation filters available during capture.
- Flexibility on naming animations and when to start capturing.

Interface Overview

Cinema Mo Cap is a software extension for Unity3D. As with any Unity window, you can position the application any way you wish. We always recommend 2 monitors. Things just look cooler that way (and you can get more work done)!



- | | |
|--|---|
|  Capture Window |  Accuracy Radar |
|  Kinect Options |  Capture Options |

Figure 1: Cinema MoCap Overview

We will go more in depth with functionality later in this documentation.



Installing Cinema Mo Cap

Cinema Mo Cap requires the Microsoft Kinect® SDK in order to operate properly. At this time, Cinema Mo Cap is only supported in Windows 7 or 8, 32 or 64 bit, and Mac computers running Windows in a virtual environment. Our product is compatible with Unity 4.x and above.

Installing Microsoft Kinect® SDK

The Microsoft Kinect® requires drivers and associated software to be loaded, so that other applications on your computer can take advantage of the features built into the product (such as Cinema Mo Cap). At this time, Microsoft requires you to download their full Microsoft Kinect® SDK for this functionality. Steps for installing the SDK are as follows:

1. Download the Microsoft Kinect® SDK at the following location:

<http://www.microsoft.com/en-ca/download/confirmation.aspx?id=40278>

2. Make sure your Kinect® is **UNPLUGGED FROM YOUR COMPUTER**. This is very important. If this step is not done, the Kinect® drivers **WILL NOT** properly install.
3. Run the executable file downloaded in step 1) above. The SDK process is a one button install, simply accept the license terms and click the install button.

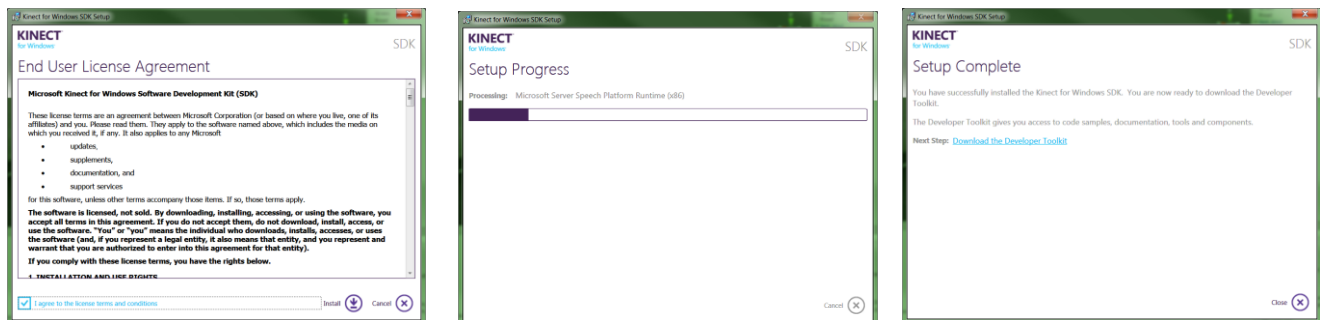


Figure 2: Microsoft SDK Install Screens

4. Click Close when prompted. Note: you do not need to install the Developer Toolkit.
5. For install instructions from Microsoft, see the following link:

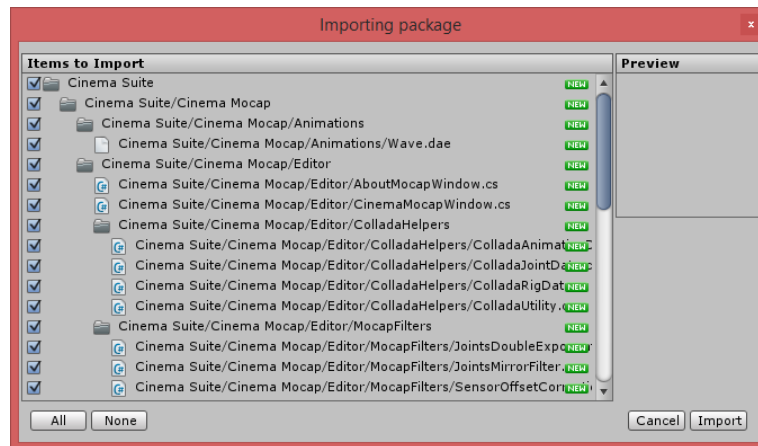
<http://msdn.microsoft.com/en-us/library/hh855354.aspx#Installation>



Installing Cinema Mo Cap Unity Package

Cinema Mo-Cap is a standard Unity3D Software Extension, and installs like any other Unity3D package. The name of the file we have created is called "CinemaMoCap.unitypackage"

In order to load the Cinema Mo Cap Unity3D package you either drag the Unity package into your current Unity3D project, or in Unity3D go to the dropdown menu: **Assets > Import Package... > Custom Package...** then browse to the CinemaMoCap.unitypackage file. If you purchased from the Unity Asset Store, this process is automatic. The below image shows the Import Package dialog box, and the contents of the Cinema Mo Cap Unity Package.



Once the Importing package dialogue appears, click the Import button. After approximately ten seconds, you will see a new drop down menu (Cinema Suite) under the window pulldown. Once installed, Cinema Mo Cap will appear in a folder, inside your Unity project.

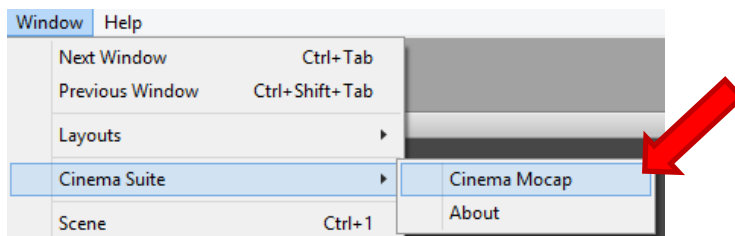


Figure 3: Unity Pull down for Cinema Mo-Cap

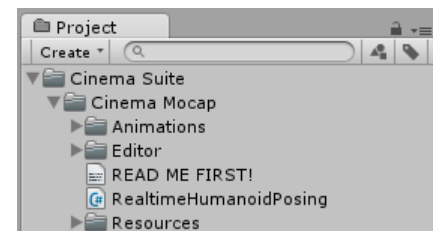


Figure 4: Unity Project Folder



Cinema Mo Cap Features

Cinema Suite Menu

From the newly installed Cinema Suite pull down menu (located under the Window pull down in Unity), you will be able to open Cinema Mo Cap. Once you select Cinema Mo Cap from the pull down, the Cinema Mo Cap window will open.

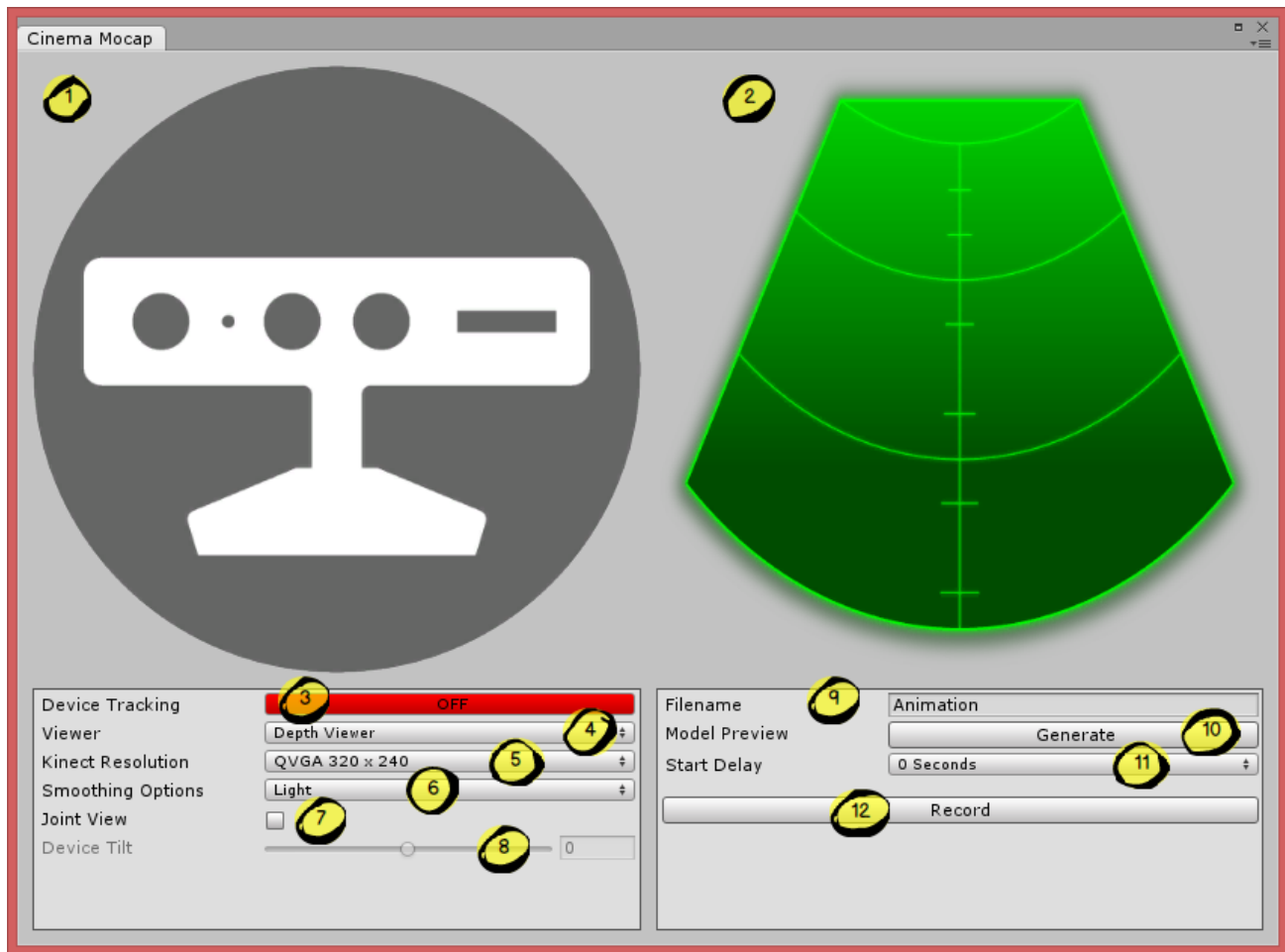


Figure 5: Detailed Overview

This is the window that will display when you first start Cinema Mo Cap. The window is Unity compliant and can be resized, dragged, and docked, just like any other Unity window. Let's get into a breakdown of all the available features, in Cinema Mo Cap.

1. Capture Window

The capture window will show feedback to the user, while they are performing actions being recorded by the motion capture device. When you first start Cinema Mo Cap, this window will display only the Cinema Mo Cap logo. When you enable Kinect® Tracking, the capture window will enable, and you will see the depth viewer that the Kinect® sees.



2. Accuracy Radar Window

The radar window will track where you are standing in relation to the Kinect®, and provide feedback on whether or not the Kinect® is capturing accurate information. If the user stays within the radar grid, the Kinect® can see that person.

3. Device Tracking

Selecting this option will turn the Kinect®'s tracking sensor on, or off. When enabled, the capture window will change to show what the Kinect® is viewing.

4. Viewer

The user can select the type of view he wishes to see, in the capture window. Choices available are:

- Depth Viewer
- Image Viewer

5. Kinect® Resolution

Cinema Mo Cap provides an option as to what resolution the user would like the Kinect® to display.

Note: this does not affect capture resolution, only the resolution by which the Kinect® is displayed in the Capture Window. Available choices are:

- QQVGA 160 x 120
- QVGA 320 x 240
- VGA 640 x 480

6. Smoothing Options

Cinema Mo Cap gives the user the opportunity to adjust how smooth they would like the motion capture to be. Choices available are:

- None
- Light
- Medium
- Heavy

Note that the heavier the smoothing, the more latency the Kinect will have while recording the capture.

7. Joint View

This option allows the user to decide if they would like to turn the motion capture nodes on or off. Changes are reflected in the Capture Window.

8. Device Tilt

For further precision in what you want to capture, you can use this slider to adjust the tilt of the Kinect® device. The user can select tilt options between -27 and +27 degrees. Once selected, the Kinect® will tilt accordingly.



9. Filename

Enter the name of the file that Cinema Mo Cap should create when the animation is complete. Once captured, the model will be called **MoCapHumanoid@<your animation>** (*with <your animation> being the name you selected*)

10. Model Preview

To improve the quality of the captured recording, the user can import a model preview into their Unity project. Once the subject is detected by the Kinect® sensor, the model will match the movements that the user is making, live inside of the Unity project.

11. Start Delay

We have provided an option to delay when your motion capture begins, so that the user can get into the proper position before recording. This option reduces the amount of cleanup required in the final animation.

12. Record Button

This button will start, and stop the motion capture session.



Using Cinema Mo Cap

Capture Process

When you capture an animation using Cinema Mo Cap, a grey textured character model is created in the current Unity project. This file is placed in the Cinema MoCap folder under "Animations". The name of the file will be reflected by the name the user provided when capturing the animation. Within this model file, will be the actual animation that was recorded during the motion capture session, again using the name the user provided.

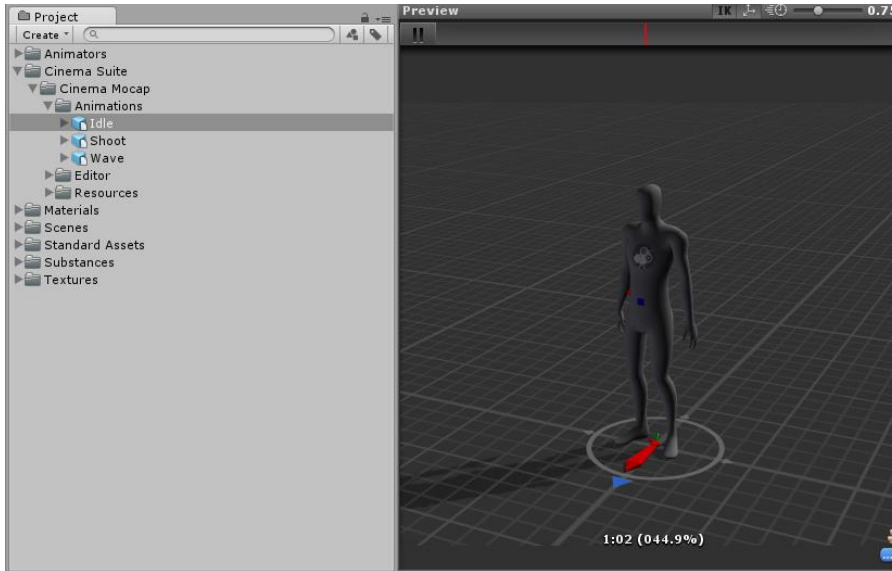


Figure 6: Cinema Mo Cap Humanoid

We take this approach, because when the model file is created (.dae format), any animations associated with it can then be used in the Mecanim system in Unity. Therefore, you can assign any captured animation to Mecanim's Animator tool inside of your Unity Project. This gives the developer the power of adding any of their Cinema Mo Cap captured animations to any humanoid or biped character in their Unity project.

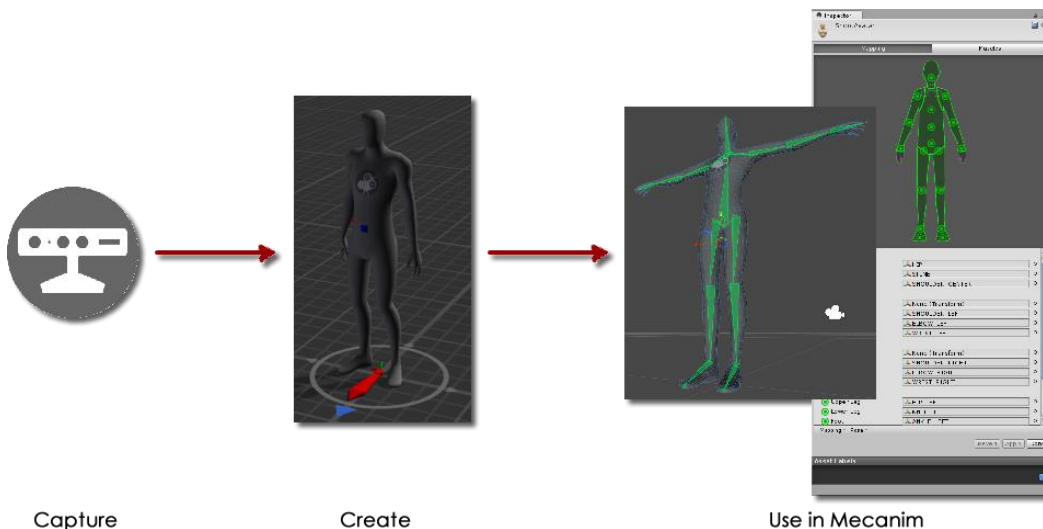


Figure 7: Cinema Mo Cap Workflow

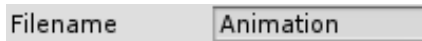


Creating a motion capture session

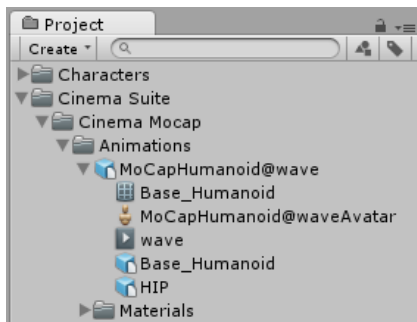
Capturing an animation in Cinema Mo Cap is quick, easy, and fun. To ensure the best results, review the steps below.

Step 1: Name the animation

By default, your animation will simply be called "animation". Pick a name that would be associated with the animation you are attempting to create. If you are creating an animation of someone waving, name it something like, "wave". If you create a new animation with the same file name as a previous recording, Cinema Mo Cap will create the new file, with an incremented number at the end (Animation1, Animation2, etc.)

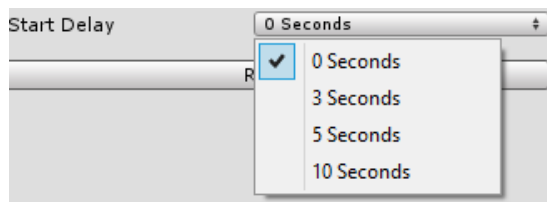


The animation that is captured will be attached and saved to a model in the current Unity project, under the **"Cinema Suite\Cinema Mocap\Animations"** folder. The model will be called **MoCapHumanoid@<your animation>**, with <your animation> being the animation. In the sample below, we captured an animation called "wave".



Step 2: Select start options

You can control how you would like the motion capture session to begin.



Start Delay: Select when capture will begin after the record button is pressed. Choices range from 0 to 10 seconds. If you pick a time greater than 0, a countdown will appear in the capture window as you stand in front of the Kinect® sensor.



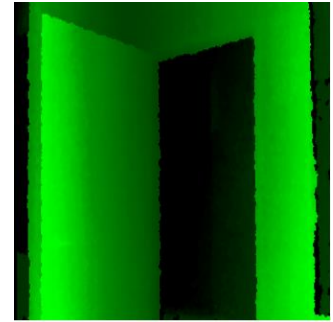
Step 3: Set Motion Capture Options

Device Tracking: Push the red "Device Tracking" button to enable the Microsoft Kinect® sensor. When selected, the Cinema Mo Cap logo will disappear, the button will turn green, and you will see what the sensor is seeing. This will be a live screen which constantly monitors the environment.

Device Tracking OFF

Viewer: You can choose three ways in which you would like the Capture window to appear.

- **Depth Viewer** will display how the Kinect® sensor views depth of the capture object. Bright green shows that the object clearly being picked up by the Kinect® sensor. As the object moves farther from the sensor or closer to it, the shade of green will change. When the sensor begins having problems detecting the object, it will turn black.
- **Image Viewer** will display exactly what the Kinect® camera sees, in full color.



Depth Sensor

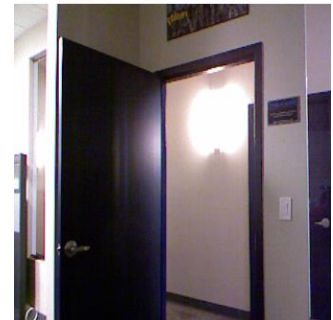
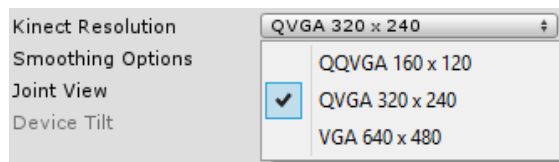


Image Sensor

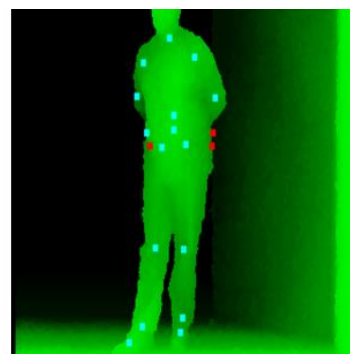
Kinect Resolution: The quality of the image displayed in the capture window can be adjusted. Select one of three resolution options from the pulldown menu. This does not affect the resolution of the motion capture itself, just display image quality.



Joint View: Selecting this checkbox will show and hide the motion capture nodes on the subject being captured. When the node is cyan in color, it means that the Kinect® sensor can fully track the joint on the subject. When the node is red, the sensor has temporarily lost exact location of the joint, and is "interpolating" or taking a best guess, on where this joint should be.



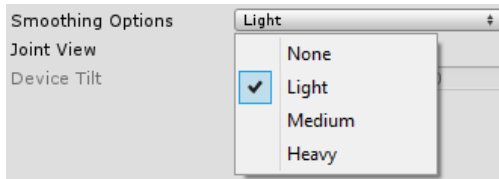
All joints have been detected by the Kinect sensor



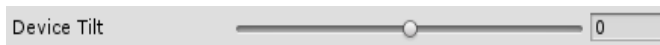
Kinect has lost track of 3 joints with hands behind back.



Smoothing Options: Cinema Mo Cap can control the quality of the animation being captured, by allowing the user to select from no smoothing to heavy smoothing. The setting tells the capture device how precise to be when capturing data. Please note, that the heavier the smoothing, the more latency (lag) the device will operate with while it calculates how much to smooth the capture. Make sure to take this into consideration, when performing in front of the device. Cinema Mo Cap will use the “light” setting by default.

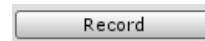


Device Tilt: If the subject being captured does not quite fit within the confines of how the Kinect® is aligned, you can control the tilt of the Kinect® using this slider. Lag between setting the tilt value, and the actual Kinect® hardware tilting is about one second, so please be patient. The values in the slider are in degrees. The Kinect® can be tilted from negative 27 degrees, to positive 27 degrees, depending on the requirements of the user. **Note:** Cinema Mo Cap contains an algorithm that will automatically correct the captured animation by compensating for sensor tilt.



Step 5: Recording

After going through the steps above, and setting the Cinema Mo Cap environment, it is time to begin your motion capture session by hitting the record button.



To ensure the best results, make sure that you follow the following guidelines:

1. **Check your surroundings:** Make sure you have enough space to operate. The space you are operating in should be open enough to capture your movement, without interference from inanimate objects (desks, furniture, etc.). Refer to the chart below for tips on where to position the subject.

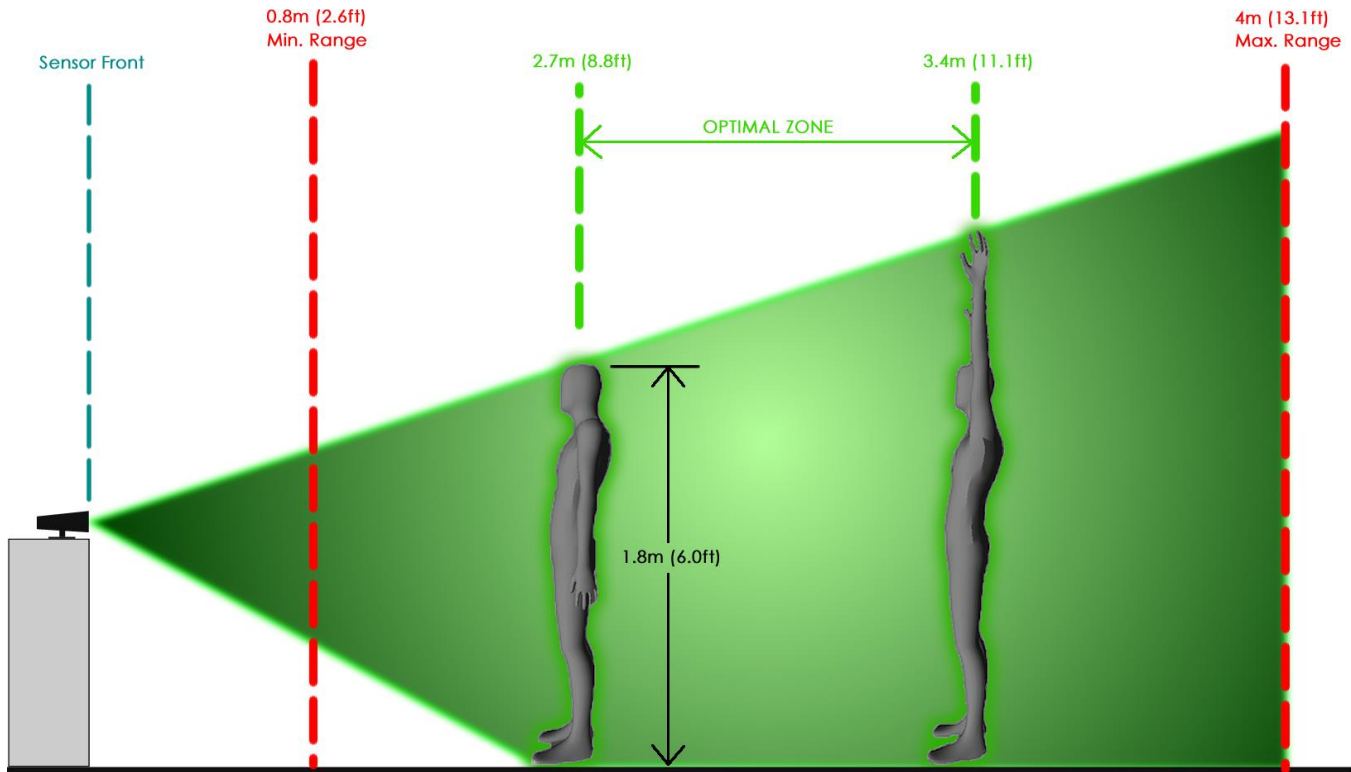


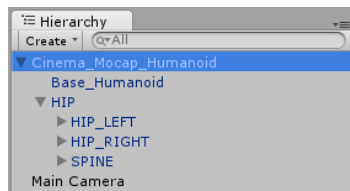
Figure 8: Optimal Positioning

2. **Enable Model Preview:** Cinema Mo Cap gives you the ability to watch your animation mapped to the Cinema Suite Humanoid model, live inside your Unity Project. To view yourself as a Unity model, follow these quick steps.

- a. Click the Model Preview “Generate” Button.



- b. A preview model will appear in your Unity Hierarchy called “Cinema_Mocap_Humanoid”. The model will be located at the 0,0,0 coordinate in your current scene.



- c. Double-click on the model in the hierarchy to focus on that model in your scene. Reposition your view using Unity if required.
- d. Start Device Tracking and step into the capture area. The Unity model will now represent your movements. Record your session when ready. See image below.

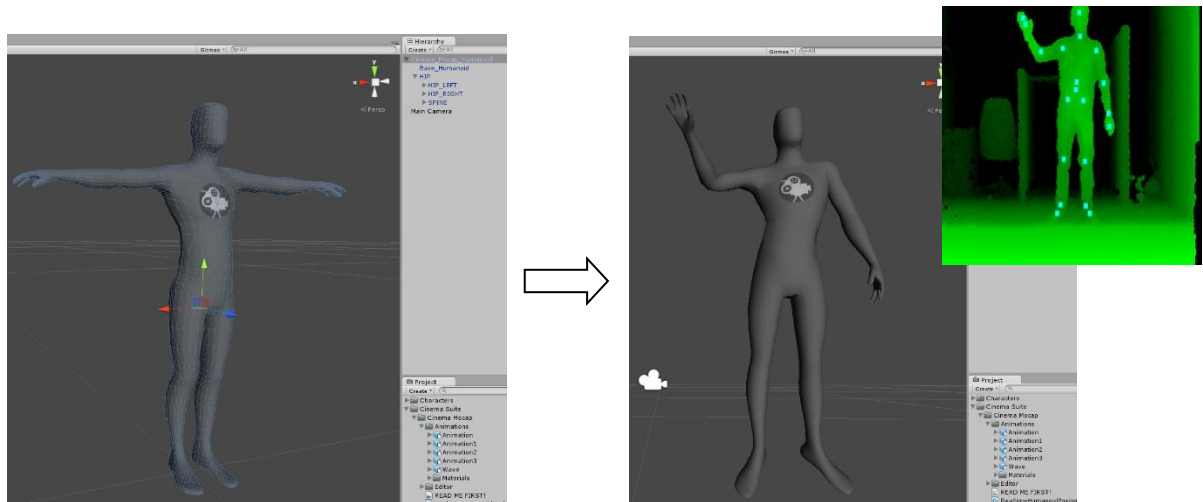
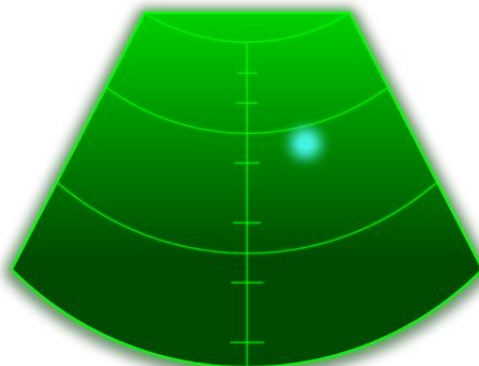
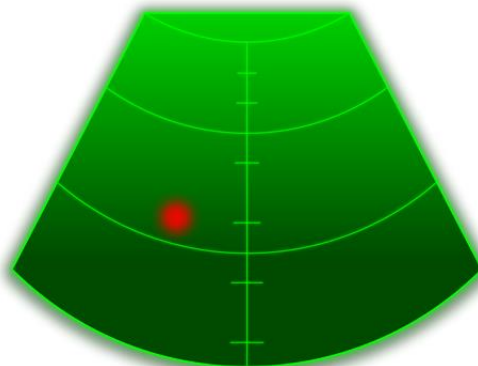


Figure 9: Model Preview Generation

3. **Check the accuracy radar:** Before recording, enable the Kinect® and step into the motion capture environment. Pay close attention to the radar. The radar is an accurate representation of the entire area the Kinect® sensor can accurately see. On the radar, the subject will be represented by a cyan colored dot. Walk around your environment, and make sure the cyan dot does not leave the radar environment. If it does, you have exited the area the sensor can accurately track. If for any reason the sensor cannot see you, this dot will turn red.

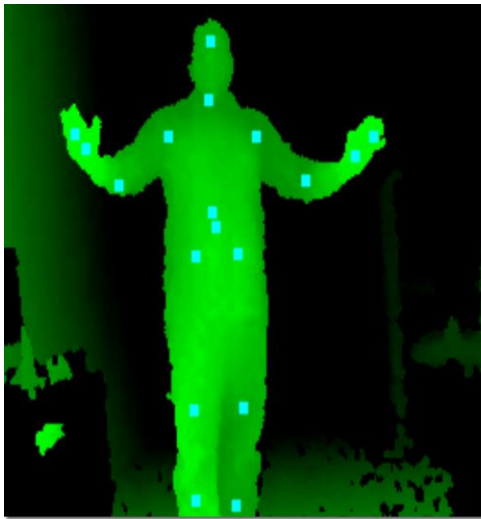


Kinect sensor can see the subject

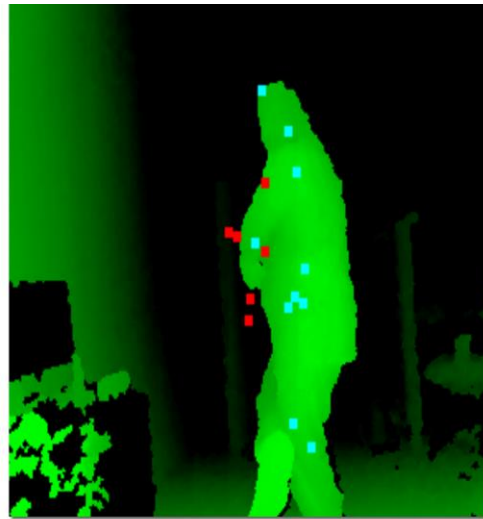


Kinect sensor has lost the subject


4. **Respect the Kinect®:** Cinema Mo Cap at this time, utilizes one single Microsoft Kinect®. The purpose of the application, is to capture simple animations in which the subject is **facing the Kinect®**. Although you may capture any animation you wish, the Kinect® **does not** have the ability to track 360° turns, very quick motion, jumping, or high action sequences. Future versions of Cinema Mo Cap will allow for multiple capture devices, which will eliminate many of these limitations.
5. **Keep joints in view:** During your capture, be conscious about keeping the motion capture nodes cyan in colour. Once a node turns red, it means the Kinect® has lost view of this joint, and is making a best guess on where that joint may be. Usually the Kinect's internal software is pretty good at doing this, but there will be times that it will affect the accuracy of your animation.



Capture is accurate and clear with all joints visible



Crossing arms, legs and hiding joints will cause Kinect to interpolate lost points. Can lead to inaccurate animation

6. **Completing your motion capture session:** Once you have completed your session, hit the stop button.  Your animation will then save to your Unity project under the filename that was originally entered, with the generated model (.dae format) file. Remember, the file will be saved under the project folder **Cinema Suite > Cinema Mocap > Animations**. If you no longer need the model preview, simply delete it from your project by selecting it in the Unity scene or highlighting and deleting from the Unity Hierarchy.



Using your new animation in Unity

About Mecanim and Unity3D

Unity uses the Mecanim system for controlling animations inside of Unity3D projects. For a full explanation on how Mecanim works, please refer to the Unity tutorial on Mecanim, located here:

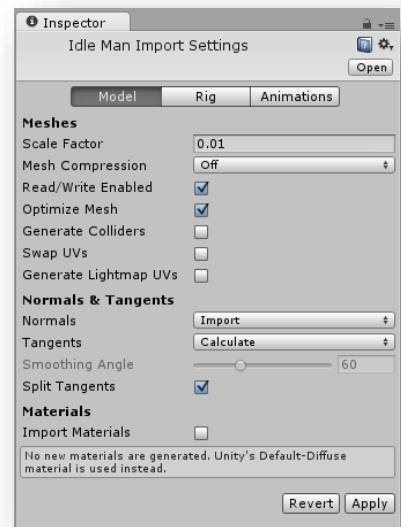
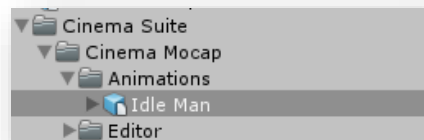
<http://video.unity3d.com/video/7362044/unity-40-mecanim-animation-tutorial>

We will cover **only basics** of Mecanim in this example, so that you can get started on using your newly created animations effectively, inside of Unity3D.

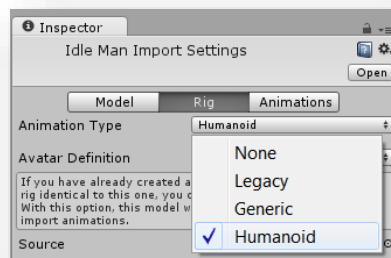
Once an animation has been created with Cinema Mo Cap, we can use these tools for cleaning up the start and end point of the animation, and control whether or not the newly created animation will be looped.

Modifying a new animation for use in Mecanim

In this example, we have created a new Animation called "Idle Man" which is now located inside the **Cinema Mocap > Animations** directory. When you select this model, the Unity Inspector will display model information as shown below:



Click on the **"Rig"** tab, and make sure you select **"Humanoid"** under animation type, to inform Unity that you are working with a biped or Humanoid model.





Next, click on the animation tab. It is here, that you can control the beginning and start point of your animation, as well as other features. We will only outline some of the key features below:

Adjust animation's start and end point
As you adjust the sliders, the lights on the side will become red, yellow, or green depending on how well your animation loop will match.

Define if you would like your animation to loop or not.

Adjust root positions and rotations of humanoid model when animation is applied.

Mirror the newly created animation

Control additional features such as defining what body parts use inverse kinematics, what transform masks will be applied to the animation, and adding additional control with animation curves. See Unity tutorial for more information.

Hit the play button to preview how your animation will look.

Apply your changes to the model when complete.

The screenshot shows the 'Inspector' window for an animation named 'Idle Man'. The 'Length' is 5.800 at 30 FPS. The 'Start' is 445 and 'End' is 619. The 'Loop Pose' checkbox is checked, and the 'loop match' indicator is green. The 'Cycle Offset' is 0. The 'Root Transform Rotation' section has 'Bake into Pose' checked and 'loop match' green, with 'Based Upon (at Start)' set to 'Body Orientation' and 'Offset' at 0. The 'Root Transform Position (Y)' section has 'Bake into Pose' checked and 'loop match' green, with 'Based Upon (at Start)' set to 'Feet' and 'Offset' at 0. The 'Root Transform Position (XZ)' section has 'Bake into Pose' checked and 'loop match' green, with 'Based Upon (at Start)' set to 'Center of Mass' and 'Offset' at 0. The 'Mirror' checkbox is unchecked. Below these are expandable sections for 'Body Mask', 'Transform Mask', and 'Curves'. At the bottom right of the Inspector are 'Revert' and 'Apply' buttons. The 'Preview' window at the bottom shows a 3D view of a humanoid model on a grid, with a play button and a time display of 2:10 (040.7%).

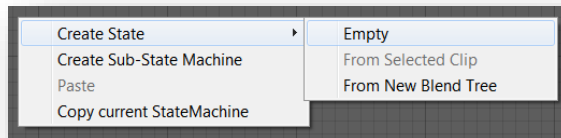
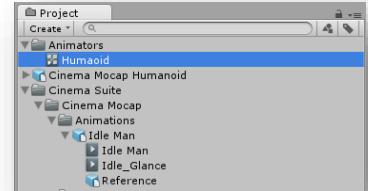
When you are done making modifications to your newly created animation, hit the **"Apply"** button. Unity3D will apply the changes to the newly captured animation.



Using the animation with other characters/avatars

Once your animation is modified and ready for use, Unity makes it very easy to add the animation to other characters you may want to use in your project. Below is a very simplified way to apply a single animation to a Unity character with your new animation.

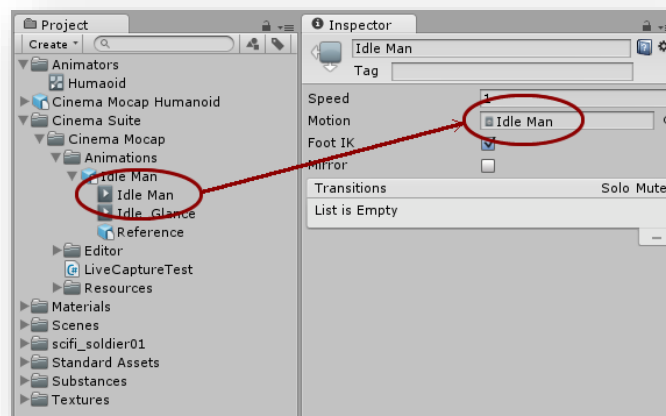
1. Create a new Animator. This can be done in Unity by right clicking in your project folder and selecting "**Create > Animator Controller**".
2. Name your Animator. We called ours "Humanoid"
3. Double click your newly created Animator, and the Animator window will open. Right click any space inside the Animator window, and select "**Create State > Empty**"



4. Highlight your newly created state. Then, in the Inspector window, give your state a name (we called ours "Idle Man").

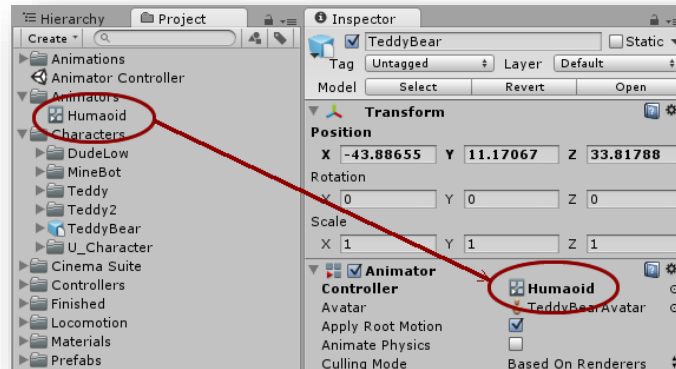


5. Drag the newly created animation from your project into the "**motion**" field. You can also click on the target icon beside the motion field, and select the animation from a list of all other animations in your project.

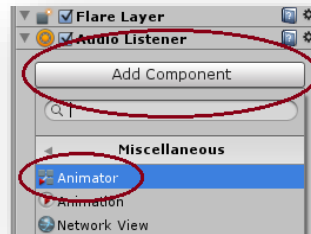




6. Select your model in your project or Hierarchy window. In the Inspector, drag your newly created Animator Controller to the "**Controller**" field of the Animator script.



7. If you do not have an animator script assigned, add one by clicking the **Add Component** button in the Inspector for your object. Then select "**Miscellaneous > Animator**"



8. Enter play mode in Unity. To do this, select the Game tab, and hit the play button. Your captured animation will now be running, and applied on the model you have transferred the animation onto! Yup, even teddy bears!





Upcoming Features

At Cinema Suite Inc. we are continually working to make our products better and better. It is our community that drives our development, and when our community asks for more, we will do our best to bring it to them. Cinema Mo Cap would not be possible without your support. Here is what we have planned, for future versions of our product.

Additional Hardware: We plan on increasing motion capture accuracy, by allowing users to use multiple motion capture devices. Multiple sensor support will allow full 360 degree motion capture, and greatly increase capture resolution, since the device will no longer have to infer position of joints. We will not only support the Microsoft Kinect® hardware, but also plan to support other OpenNI compatible devices, such as the ASUS Xtion Pro®.

Audio: The ability to start and stop the motion capture session by using voice commands, will be added in a future version. Also, the ability to record audio while performing the motion capture session will be investigated. We will also investigate controlling the device(s) with custom commands.

Control Animation Extremities: Sometimes when an animation is created, you want the hands to be either open, or closed. We will provide the ability to select which hand you want open or closed, be it the left hand right hand or both, which will automatically be incorporated into the animation when the motion capture session is stopped.

New Animation Options: Create animations while sitting down, and not just standing. Also, support for multiple subjects to be captured at the same time, each creating a separate animation.



Community

We want to hear from you! Quite simply, without you, none of what we develop would be possible. We always want to hear from our community, whether it is for feedback, sharing ideas, adding features, and providing additional help. Here's how you can find us:

Website: www.cinema-suite.com

Facebook:  [/CinemaSuiteInc](https://www.facebook.com/CinemaSuiteInc)

Twitter:  [/CinemaSuiteInc](https://twitter.com/CinemaSuiteInc)

YouTube:  [/CinemaSuiteInc](https://www.youtube.com/CinemaSuiteInc)

Blog: www.cinema-suite.com/blog

Email: support@cinema-suite.com

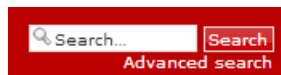
Forums: www.cinema-suite.com/forum

Help and Support

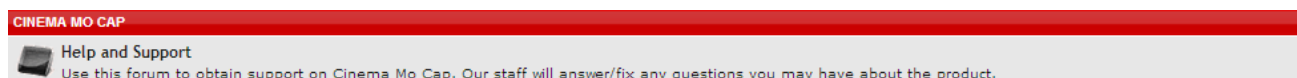
Cinema Suite Forums:

The fastest way to obtain support for Cinema Mo Cap is to visit the Cinema Suite forums. Our forums can be found at www.cinema-suite.com/forum.

Before creating a post, please make sure to search the forum using the search bar located in the upper right area of our forum site.

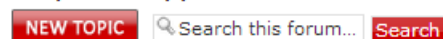


If you cannot find what you are looking for, please create a new forum topic under the Cinema Mo Cap category "**Help and Support**" by clicking on the text below.



Once inside the Help and Support area for Cinema Mo Cap, create a new topic by selecting the new topic button in the upper left area of the page.

Help and Support





We constantly monitor our forums for new support inquiries.

Email:

If you fail to receive an answer in the forums, you may also email our support team directly. Our email address is support@cinema-suite.com.

Please note the following when emailing support for quickest service:

1. We need 2-3 days to process email support requests, due to volume.
2. For fastest service, please provide your Unity Asset Store Purchase invoice number for our product.
3. Put invoice number in subject field, with brief description of problem.
4. In the body of the email, please provide as much of the following as possible, for quickest service:
 - Detailed explanation of the problem. Provide screenshots if possible.
 - What version of Unity?
 - What version of Cinema Mo Cap? (Go to **Window>Cinema Mo Cap>About** to obtain version number).
 - Sequence of events leading to issue.

Licensing:

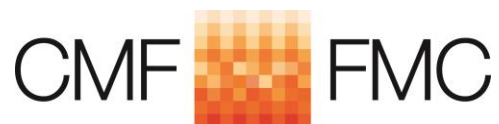
Licensing for Cinema Mo Cap is governed by the Unity Asset Store End User License Agreement (EULA). For more information about the EULA, please [click here](#) for more information.



Thank you

Without you, what we do would not be possible. We sincerely thank you for purchasing Cinema Mo Cap, and allowing us to create software that helps the community do their work quicker, easier, and hopefully with a bit more fun.

Cinema Suite Inc, would like to extend a special thank you to the Canada Media Fund, for making Cinema Mo Cap Possible.



www.cmf-fmc.ca

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