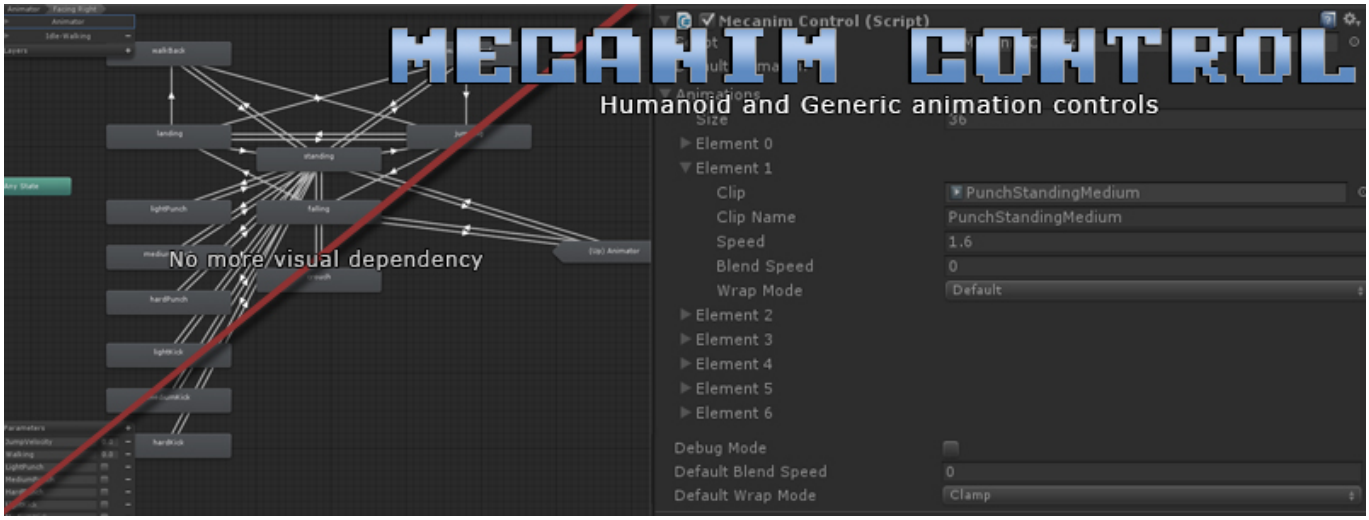
Mecanim Control

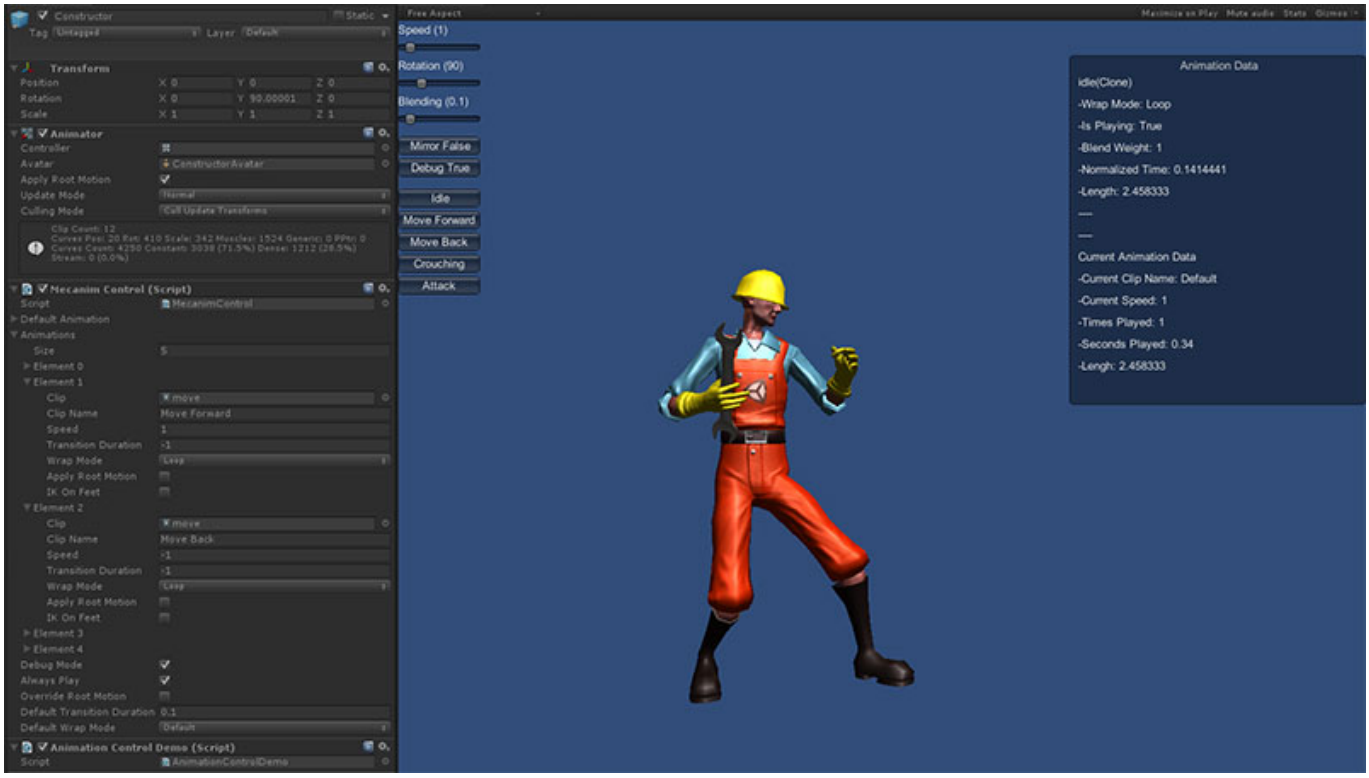
Your ultimate solution for Mecanim based games!



Mecanim Control is a coding tool made that allow for a wider variety of common methods used by the Animation component with Mecanim (Humanoid/Generic) animations. It allows you to not only dynamically load any animation clip during runtime, but also tap into several methods currently missing in this magnificent system.

Mecanim Control is a sub-tool of Universal Fighting Engine. It's source code is available entirely free in the **Source** version of UFE.

Overview

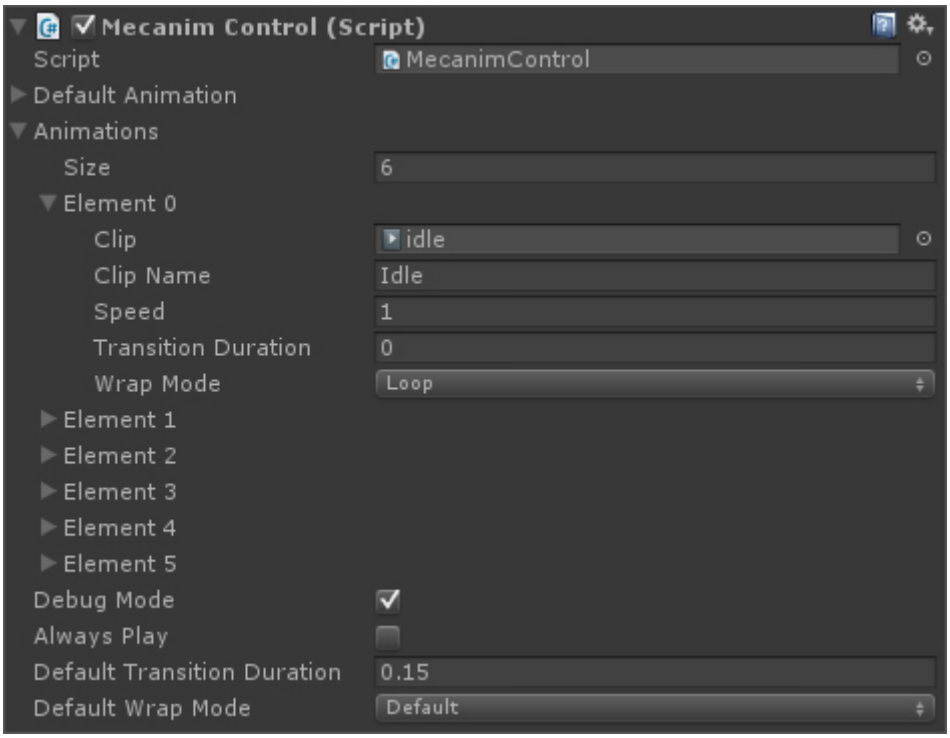


You can use MecanimControl much like you would use the animation component.
To play a simple animation use *MecanimControl.Play*
To cross-fade between animations use *MecanimControl.CrossFade* -or- one of the *MecanimControl.Play* alternatives.
To change how animations wrap (Loop, Once, PingPong) change the WrapMode of the respective *AnimationClip* in their import settings, or use *MecanimControl.SetWrapMode* to change it at runtime.
AnimationData can be used to modify the clip, playback speed, and direct control over blending.

MecanimControl also supports enumerators so you can loop through all AnimationData like this:

```
using UnityEngine;
using System.Collections;

public class AnimationControlDemo : MonoBehaviour {

    private MecanimControl mecanimControl;

    void Start () {
        mecanimControl = gameObject.GetComponent<MecanimControl>();
    }

    void OnGUI(){
        foreach(AnimationData animationData in mecanimControl.animations){
            if (GUILayout.Button(animationData.clipName)){
                mecanimControl.Play(animationData, mirror);
            }
        }
    }
}
```

Public Variables



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defaultanimation **Default Animation**
AnimationData *defaultAnimation*;
By default, if no order is given, the animator will play the animation stored in this AnimationData.

Note
If you don't assign a default animation Mecanim Control will assign the first animation from animations.

```
void Start () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.defaultAnimationData.speed = .5f;
}
```

---

animations **Animations**
AnimationData[] *animations*;

Properties
AnimationClip clip - The AnimationClip file.
string clipName - Animation name.
float speed - Animation speed.
float transitionDuration - Blending Duration.
WrapMode wrapMode - The animation's default WrapMode. bool applyRootMotion - If this and *Override Root Motion* is toggled this animation will toggle the Animator's Root Motion

Description
This array contain all the AnimationData stored by either the UI or by using AddClip. Its then used to emulate a state machine under the *Animator Controller*.

```
void Start () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    foreach(AnimationData animationData in mecanimControl.animations) {
        animationData.speed = .5f;
    }
}
```

---

debugmode **Debug Mode**
bool *debugMode*;
Toggles a GUI box containing all the information about the current clip playing as well as its blending weight.

```
void Start () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.debugMode = true;
}
```

---

alwaysplay **Always Play**
bool *alwaysPlay*;
If an animation is set to *WrapMode.Once* and *alwaysPlay* is toggled on, after the clip ends it will immediately play the *default animation*.

```
void Start () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.alwaysPlay = true;
}
```

---

overriderootmotion **Override Root Motion**

bool *overrideRootMotion*;
If both applyRootMotion (under the animation element) and this variable is *true*, this animation will toggle the Animator's Root Motion.

```
void Start () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.overrideRootMotion = true;
    mecanimControl.animationData[0].applyRootMotion = true;
}
```

---

defaulttransitionduration **Default Transition Duration**
float *defaultTransitionDuration*;
If an animation has its blending speed set to 0, it will use this value instead.

```
void Start () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.defaultTransitionDuration = .2f;
}
```

---

defaultwrapmode **Default Wrap Mode**
float *defaultWrapMode*;
If an animation has its *wrapmode* set to *default*, it will use this value instead.

```
void Start () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.defaultWrapMode = WrapMode.Once;
}
```

Public Functions

```
void OnGUI(){
    if (GUILayout.Button("Invert Speed")) mecanimControl.SetSpeed(-mecanimControl.GetSpeed());
    if (GUILayout.Button("Mirror "+ mirror)) {
        mirror = !mirror;
        mecanimControl.SetMirror(mirror);
    }

    GUILayout.Space(10);

    foreach(AnimationData animationData in mecanimControl.animations){
        if (GUILayout.Button(animationData.clipName)){
            mecanimControl.Play(animationData, mirror);
        }
    }
}
```

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addclip **AddClip**
void *AddClip(AnimationClip clip, string name);*
void *AddClip(AnimationClip clip, string name, float speed, WrapMode wrapMode)*;

Parameters
clip - The AnimationClip file.
name - Animation name.
speed - Animation speed.
wrapMode - The animation's default WrapMode.

Description: Adds a clip to *animations* with the name *newName*.

```
using UnityEngine;
using System.Collections;

public class Example : MonoBehaviour {
    public AnimationClip walkClip;
    void Start () {
        mecanimControl = gameObject.GetComponent<MecanimControl>();
        mecanimControl.AddClip(walkClip, "walk");
    }
}
```

---

crossfade **CrossFade**

void *CrossFade(string clipName, float blendingTime);*
void *CrossFade(string clipName, float blendingTime, float normalizedTime, bool mirror);*
void *CrossFade(AnimationData animationData, float blendingTime, float normalizedTime, bool mirror);*

Parameters
clipName - Animation name.
animationData - The correspondent animation data.
blendingTime - The blending duration between the 2 animations.
normalizedTime - The timeline's position of the animation to be played (0-1)
mirror - Should the animation be mirrored?

Description: Fades the animation with name *clipName* in over a period of *blendingTime* seconds as it fades other animations out.
You can also set *normalizedTime* to set where, in its timeline, you want the animation to start (0-1) as well as toggle mirror.

```
using UnityEngine;
using System.Collections;

public class Example : MonoBehaviour {
    public AnimationClip walkClip;
    void Start () {
        mecanimControl = gameObject.GetComponent<MecanimControl>();
        mecanimControl.CrossFade("walk", .2f);
    }
}
```

---

getanimationdata **GetAnimationData**
AnimationData *GetAnimationData(AnimationClip clip);*
AnimationData *GetAnimationData(string clipName);*

Parameters
clip - Animation clip.
clipName - Clip name.

Description: Returns the AnimationData related to that animation name or clip.

```
using UnityEngine;
using System.Collections;

public class Example : MonoBehaviour {
    public AnimationClip walkClip;
    void Start () {
        mecanimControl = gameObject.GetComponent<MecanimControl>();
        mecanimControl.AddClip(walkClip, "walk");
        Debug("Animation Name:"+
mecanimControl.GetAnimationData(walkClip).clipName);
    }
}
```

getcurrentanimationdata **GetCurrentAnimationData**
AnimationData *GetCurrentAnimationData();*

Description: Get the AnimationData currently running.

```
using UnityEngine;
using System.Collections;

public class Example : MonoBehaviour {
    public AnimationClip walkClip;
    void Start () {
        mecanimControl = gameObject.GetComponent<MecanimControl>();
        Debug("Animation Name:"+
mecanimControl.GetCurrentAnimationData().clipName);
    }
}
```

---

getcurrentclipname **GetCurrentClipName**
string *GetCurrentClipName();*

Description: Get the name of the current running clip.

```
using UnityEngine;
using System.Collections;

public class Example : MonoBehaviour {
    void Start () {
        mecanimControl = gameObject.GetComponent<MecanimControl>();
        Debug("Animation Name:"+ mecanimControl.GetCurrentClipName());
    }
}
```

---

getcurrentclipposition **GetCurrentClipPosition**
float *GetCurrentClipPosition();*

Description: Get the *normalized time* of the current running clip. (0-1)

```
void CheckProgress() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    Debug("Animation Progress (%):"+ mecanimControl.GetCurrentClipPosition()
* 100);
}
```

---

getcurrentclipplaycount **GetCurrentClipPlayCount**
int *GetCurrentClipPlayCount();*

Description: Get the number of times the current clip has played. Only works if the animation's WrapMode is set to either *WrapMode.Loop* or *WrapMode.PingPong*

```
void CheckProgress() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    Debug("Times Played:"+ mecanimControl.GetCurrentClipPlayCount());
}
```

---

getmirror **GetMirror**
bool *GetMirror();*

Description: Get the current mirror state of the *emulated runtime animator*.

```
void FaceLeft () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    if (!mecanimControl.GetMirror()) mecanimControl.setMirror(true);
}
```

---

getspeed **GetSpeed**
float *GetSpeed();*
float *GetSpeed(AnimationClip clip);*
float *GetSpeed(string clipName);*

Parameters
clip - Animation clip.
clipName - Clip name.

Description: Get the speed value set for *animationClip/clipName*.
no parameters - Get the speed the animator is running based on the current running animation.

```
void SlowDown() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    if (mecanimControl.GetSpeed() > 1) mecanimControl.SetSpeed(1);
}
```

---

isplaying **IsPlaying**
bool *IsPlaying(string clipName);*
bool *IsPlaying(AnimationClip clip);*
bool *IsPlaying(AnimationData animationData);*

Description: Returns true if *clipName*, *clip* or *animationData* is playing.

```
void Example() {
```

```
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    if (mecanimControl.IsPlaying("walk")) Debug.Log("Walk is playing");
}
```

---

pause **Pause**
void *Pause();*

Description: Pauses the animator component.

```
void Example() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.Pause();
}
```

---

play **Play**
void *Play();*
void *Play(string clipName);*
void *Play(AnimationClip clip);*
void *Play(AnimationData animationData);*
void *Play(string clipName, bool mirror);*
void *Play(AnimationClip clip, bool mirror);*
void *Play(AnimationData animationData, bool mirror);*
void *Play(string clipName, float blendingTime, float normalizedTime, bool mirror);*
void *Play(AnimationClip clip, float blendingTime, float normalizedTime, bool mirror);*

Parameters
clip - Animation clip.
clipName - Animation name.
animationData - The correspondent animation data.
blendingTime - The blending duration between the 2 animations.
normalizedTime - The timeline's position of the animation to be played (0-1)
mirror - Should the animation be mirrored?

Description: Plays animation. *Play* can be used in several ways, including blending. If no blending is set, Play will try using the default blending value. If blending is set to -1, the animation will be played abruptly without any blending.

If the animation is not set to be looping and *alwaysPlay* is toggled off it will be stopped after playing.

If no parameters are used, *Play* can be used as a follow up to *Pause*. It restores the speed of the Animator to the current animation speed value.

Normalized Time lets you start the animation from a predefined position in the animation timeline (0-1).

```
void Example() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.Play();
```

```
}
```

```
void Example() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.Play("walk", .2f, 0, true);
}
```

---

removeclip **RemoveClip**
void *RemoveClip(string clipName);*
void *RemoveClip(AnimationClip clip);*

Description: Removes the *AnimationData* from *animations* related to *clipName/clip*.

```
void RemoveAnimation(string animation) {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.RemoveClip(animation);
}
```

---

restorespeed **RestoreSpeed**
void *RestoreSpeed();*

Description: Restores the speed of the animator component to the original value from the current animation being played.

```
using UnityEngine;
using System.Collections;

public class Example : MonoBehaviour {

    private MecanimControl mecanimControl;

    void SlowMo(string animation) {
        mecanimControl.SetSpeed(.01f);
        Invoke("Restore", 2);
    }

    void Restore() {
        mecanimControl.RestoreSpeed();
    }
}
```

---

rewind **Rewind**
void *Rewind();*

Description: Inverts the speed of the animator component.

```
void Example() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.Rewind();
}
```

---

setcurrentclipposition **SetCurrentClipPosition**
void *SetCurrentClipPosition(float normalizedTime);*
void *SetCurrentClipPosition(float normalizedTime, bool pause);*

Description: Set the position in the timeline of the current playing clip (0-1). If pause is toggled on, the animation will be paused afterwards.

```
void Example() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.SetCurrentClipPosition(.3f, true);
}
```

---

setdefaultclip **SetDefaultClip**
void *SetDefaultClip(AnimationClip clip, string name, float speed, WrapMode wrapMode);*

Description: Sets the *defaultclip* through code (instead of the UI).

```
using UnityEngine;
using System.Collections;

public class Example : MonoBehaviour {

    private MecanimControl mecanimControl;
    private AnimationClip idle;

    void Start() {
        mecanimControl.SetDefaultClip(idle,"Idle", 1, WrapMode.Loop);
    }
}
```

---

setmirror **SetMirror**
void *SetMirror(bool mirror);*
void *SetMirror(bool mirror, float blendingTime);*
void *SetMirror(bool mirror, float blendingTime, bool forceMirror);*

Description: When toggled on, every animation will be played with the mirror tag toggled on.

```
void FaceLeft () {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    if (!mecanimControl.GetMirror()) mecanimControl.setMirror(true);
```

```
}
```

---

setspeed **SetSpeed**
void *SetSpeed(float speed);*
void *SetSpeed(string clipName, float speed);*
void *SetSpeed(AnimationClip clip, float speed);*

Description: Change the speed value of the Animator component or AnimationData based on *clipName/clip*.
If no parameters are used, SetSpeed will change the global speed from the Animator component.

```
void SlowDown() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    if (mecanimControl.GetSpeed() > 1) mecanimControl.SetSpeed(1);
}
```

---

setwrapmode **SetWrapMode**
void *SetWrapMode(WrapMode wrapMode);*
void *SetWrapMode(AnimationData animationData, WrapMode wrapMode);*
void *SetWrapMode(AnimationClip clip, WrapMode wrapMode);*
void *SetWrapMode(string clipName, WrapMode wrapMode);*

Description: Sets the Wrap Mode of an AnimationData based on *clipName/clip*.
If no parameters are used, SetWrapMode will change *defaultWrapMode*.

```
void ClampCurrentClip() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.SetWrapMode(mecanimControl.GetCurrentAnimationData,
WrapMode.Clamp);
}
```

---

stop **Stop**
void *Stop();*

Description: Stops any animation from playing and starts playing the default animation.

```
void PlayDefaultAnimation() {
    mecanimControl = gameObject.GetComponent<MecanimControl>();
    mecanimControl.Stop();
}
```

Public Events

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onanimationbegin **OnAnimationBegin**
void *AnimEvent(AnimationData animationData);*

Description: Fires when an animation begins.

```
void OnAnimationBegin(AnimationData animData) {
    if (animData.clipName == "walk") Debug.Log("character is walking");
}
```

---

onanimationend **OnAnimationEnd**
void *AnimEvent(AnimationData animationData);*

Description: Fires when an animation ends.

```
void OnAnimationEnd(AnimationData animData) {
    if (animData.clipName == "walk") Debug.Log("character has stopped
walking");
}
```

---

onanimationloop **OnAnimationLoop**
void *AnimEvent(AnimationData animationData);*

Description: Fires when an animation loops. This is only triggered if the animation WrapMode is set to either *WrapMode.Loop* or *WrapMode.PingPong*

```
void OnAnimationLoop(AnimationData animData) {
```

```
    if (animData.clipName == "walk")
        Debug.Log("walking animation has looped "+ animData.timesPlayed + "
times.");
}
```
