A FREE Invector addon brought to you by

Shades of Insomnia

the undisputed kings of feature creep...

Contents

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V2.1 Features

- Full pooling system, automatic or pre-warmed
- Centralized spawn class linked to the pooler, including spawns on birth, death, body removal, spell hits & explosions, trapped objects, proximity triggers, and more
- Player and AI magic enabled character creation wizards for easy setup
- vInventory integration for spells, including custom AI item manager
- Leveling system with data abstraction layer, modifiable attributes, resistances & formula's
- Main menu system linked to the data abstraction layer
- SQLLite/EasySave2 abstract data layer implementation (easy to clone for other data formats)
- Character information screen
- Attribute System with Point Spending
- Magic weapons and armour with damage and resist types linked to the levelling system
- New Damage System with Damage Over Time, and various Damage Types
- Damage Mitigation System including resist types
- Weapon trails effects
- Custom animation on AI instantiation
- Status effects aka burning, poisoned, frozen etc
- Generic AI without modifying the Invector core (Experimental)
- Ranged AI for Invector Core AI capable of spell casting or arrow shooting.
- Feed vWaypoints into the animator and trigger actions
- 600 free gems unique to this asset (uses the Unity Gem Shader)
- Merge LOD levels from simplygon output onto singular bone structure
- Character equipment material changer (across multiple LOD levels
- Generic ragdoll builder which works from bone chains
- Archery and Thrown weapon System
- Complete custom-made spells and Skills Examples, free for commercial use
- Custom Emissions Shader
- Shield Bash System
- Custom inputs for spells
- Magic Projectile Script with homing and advanced targeting systems
- Custom hand effect's
- Animator based multi-layered spell casting system
- Custom Spell Sounds
- Physics Based Spells
- Gold and Object Collection System that shows in the Character Screen
- Custom Scripts to do everything from Raise the Dead to Heal.
- Basic Character Creation System (Name, Axis, Class, Race and Alignment)
- Damage Mitigation System
- Centralised spell book wizard outputs/validates multiple animators at once

Installation Requirements / Order

- Ensure using Unity 5.6+ (ideally 2017.1+)
- Install Invector Melee (or Shooter) Controller 2.x
- Check Edit->Project Settings->Player->Other Settings
    - To view the demos as intended set colour space to linear
- Install easysave2 if owned (if not don't import CharacterDataEasySave2.cs), SQLLite is included in the package as a free alternative
- Install the ShadesSpellSystem2.0aMelee.unitypackage or ShadesSpellSystem2.0aShooter.unitypackage as appropriate
- To run the mainmenu_lobby scene, add the level1 and level2 scenes to the build settings.
- If you're running a non-windows OS then you will need to download the appropriate SQLLite dll, see https://www.sqlite.org/download.html

Step by Step New Project Tutorial

How to get your Invector player/AI's setup in a fresh scene, this chapter covers the required components, settings that are mandatory when setting up the spell system. Note that currently the spell system is targeting the melee rather than shooter controller, though there is no reason why similar setup cannot be applied to shooter, though the relevance would be a good question.

It is assumed that the package installation steps have already been performed, including the Invector Melee Package, the Shades Spell System Package and the compiler pre-processor directive **INVECTOR** confirmed present.

See the scenes directory for each step completed to fast forward into the tutorial, see the last scene to just play with the end-result "Tutorial_3_3_SetupAIMagic".

Build a Simple Test Scene

1. Create a new scene
2. Add a plane
    a. name it "Ground"
    b. Tick "Static"
    c. zero its position
    d. set its scale to 10
    e. drag material "carbon2.mat" onto the plane *\Invector-3rdPersonController\Basic Locomotion\3D Models\Textures\prototype_textures\Materials*
3. Add the offensive / defensive chests at positions (-2.5, 0, 2.5) and (2.5, 0, 2.5) *\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\Inventory*
4. Open the NavMesh builder (window->Navigation) with the plane selected
    a. Select tab "Bake"
    b. Press "Bake"

Setup the Player for Magic

1. Open the Melee Controller wizard *(Invector->Melee Combat->Create Melee Controller)*
    a. Set the FBX Model to one of the VBOT prefabs *\Invector-3rdPersonController\Basic Locomotion\3D Models\Characters\Invector@V-Bot 2.0\Prefab*
    b. Set the animator controller to "MagicMeleeCombatv3" *\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\Mecanim*
    c. Set the Camera List Data to "vMeleeCombat@CameraState" as per normal
    d. Set the HUD to the magic UI prefab "MagicHUD.prefab" *\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\UI*
    e. Select the LOD1 Body mesh from the dropdown
    f. Press "Create"
2. Open the Ragdoll wizard *(Invector->Basic Locomotion->Components->Ragdoll)* with vThirdPersonMelee still selected in the scene hierarchy
    a. Leave the defaults for humanoid selected
    b. Press "Create"
    c. Find the Ragdoll System component in the inspector
        i. Press Open Properties
        ii. Check Disable Colliders
        iii. Set Collision Clip to "RagdollCollision.wav" *\Invector-3rdPersonController\Basic Locomotion\Audio\RagdollCollision*
3. Open the Magic Controller wizard *(Invector->Shades Spell System->Create Magic Controller)* with the vThirdPersonMelee still selected in the scene hierarchy
    a. Press "Create"
4. Find the "CharacterInstance" script on vThirdPersonMelee
    a. Set the character name
    b. Choose the character type (Lawful, Good, Human, Mage)
    c. Add 5 Mana Regen
    d. Set the Level to 20
    e. Press "Rnd" on Unspent Skill Points

Setup Invector AI for Magic

1. Launch the Invector AI wizard (*Invector->Melee Combat->Create NPC)*
    a. Leave the Character Type as AI
    b. Set the FBX model to one of the VBOT's *\Invector-3rdPersonController\Basic Locomotion\3D Models\Characters\Invector@V-Bot 2.0\Prefab*
    c. Set the animator controller to "MagicMeleeCombatv3" *\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\Mecanim*
    d. Press "Create"
    e. Select vEnemyAI in the hierarchy and set PositionZ to 10 and RotationY to 180, ie facing the player
2. Open the Ragdoll wizard *(Invector->Basic Locomotion->Components->Ragdoll)* with vEnemyAI still selected in the scene hierarchy
    a. Leave the defaults for humanoid selected
    b. Press "Create"
    c. Find the Ragdoll System component in the inspector
        i. Press Open Properties
        ii. Check Disable Colliders
        iii. Set Collision Clip to "RagdollCollision.wav" *\Invector-3rdPersonController\Basic Locomotion\Audio\RagdollCollision*
3. Open the Magic Controller wizard *(Invector->Shades Spell System->Create Magic NPC Controller)* with the vEnemyAI still selected in the scene hierarchy
    a. Select the LOD1 Body mesh from the dropdown
    b. Press "Create"
4. Find the "CharacterInstance" script on vEnemyAI
    a. Set the character name
    b. Choose the character type (Chaotic, Evil, Human, Mage)
    c. Add 5 Mana Regen
    d. Set the Level to 20
    e. Press "Rnd" on Unspent Skill Points
5. Find the "MagicAIItemManager" script on vEnemyAI
    a. Press "Add Item"
    b. Choose a spell (or two) and press "Add"

Manual Player Component Setup

1. Follow steps 1 & 2 of the "Setup the Player for Magic" section
2. Add the script "vHit Damage Particle" to vThirdPersonMelee
    a. Set the "Default Hit Effect" to "bloodSplash.prefab" *\Invector-3rdPersonController\Basic Locomotion\3D Models\Particles\DamageEffect\prefabs*
3. Open the Inventory wizard *(Invector->Inventory->Item Manager)* with the vThirdPersonMelee still selected in the scene hierarchy
    a. Set the Inventory Prefab to "Inventory_MeleeMagic_Auto.prefab" *\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\Inventory*
    b. Set the Item List Data to "vMeleeMagic_ItemListDataV2.asset" *\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\Inventory*
    c. Press "Create"
4. Drag the "ItemCollectionDisplay.prefab" onto the vUI gameobject in the hierarchy *\Invector-3rdPersonController\ItemManager\Prefabs*
5. Drag the "Inventory_MeleeMagic.prefab" into the hierarchy root
6. Add the CharacterInstance script to vThirdPersonMelee
    a. Choose the character type (Lawful, Good, Human, Mage)
    b. Add 5 Mana Regen and set the Level to 20
    c. Press Rnd on Unspent Skill Points
7. Expand the "vThirdPersonController" script and set the event "OnReceiveDamage" to "CharacterInstance->OnReceiveDamage"
8. Create an empty child gameobject under the vThirdPersonController root, move to chest height (Y 1.5), forward approx. 0.9 on the Z axis and name MagicSpawn
9. Add script "MagicInput" to vThirdPersonMelee
    a. Enable "Pooled Magic"
    b. Expand "Spells Triggers", set size to 5 and expand it
    c. Press "Use" on the input and set to keyboard to F1, F2, F3 etc
    d. In the hierarchy drag the UI display slots to each "Equip Display" Inventory_MeleeMagic->EquipmentDisplayWindow->EquipDisplay_Spell (1-5)
    e. Expand each of the inputs "Equip Slots", set size to 1
    f. Then drag from the hierarchy to the 5 "EquipSlot" elements and link the OnAddItem/OnRemoveItem to MagicInput->SpellEquiped/SpellUnEquiped *Inventory_MeleeMagic_Auto->InventoryWindow->EquipmentInventory ->EquipAreaWindow->EquipMentArea_Spells->EquipSlots->EquipSlot (1-5)*
    g. Drag the newly created MagicSpawn gameobject (step 8) to the MagicSpawnPoint
    h. In the hierarchy
        i. drag "vUI->HUD->XP" to "XP Text"
        ii. drag "vUI->HUD->Level" to "Level Text"
        iii. drag "vUI->HUD->Level up" to "Level Up Text"
        iv. drag "vUI->HUD->mana" to "Mana Slider"
    i. Press "Open Events" and link OnUseMana event to CharacterInstance->UseMana
10. Expand the "ItemManager" events and set
    a. "OnUseItem" event to "MagicInput->UsePotion"
    b. "OnOpenCloseInventory" event to "vMeleeCombatInput->LockInput"
11. Expand the "Melee Manager" events and set
    a. "OnDamageHit" event to "CharacterInstance->OnSendHit"

Manual Invector AI Component Setup

1. Follow steps 1 & 2 of the “Setup Invector AI for Magic” section
2. Add the script “vHit Damage Particle” to vEnemyAI
    a. Set the “Default Hit Effect” to “bloodSplash.prefab” *\Invector-3rdPersonController\Basic Locomotion\3D Models\Particles\DamageEffect\prefabs*
3. Add the script “vMelee Manager” to vEnemyAI
    a. Set the Hit Properties->”Hit Damage Tags” to “Player”
4. Add the script “Character Instance” to vEnemyAI
    a. Set the name
    b. Add 1 life and mana regen
    c. Set the level
    d. Press “Rnd” on distribute points
5. Create an empty gameobject at the root of vEnemyAI in the hierarchy
    a. Name it “MagicSpawn”
    b. Set position to Y 1.5 and Z 0.9
6. Add script “Magic AI Item Manager” to vEnemyAI
    a. Set “Item List Data” to “vMeleeMagic_ItemListDataV2” *\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\Inventory*
    b. Change the Item Filter to “Spells”
    c. Press “Add Item”
    d. Choose one of the spells, (eg Fireball) from the list and press “Add”
7. Add script “Magic AI” to vEnemyAI
    a. Drag the MagicSpawn gameobject from the hierarchy to the “Magic Spawn Point” property
8. Add the Enemy Health/Mana display
    a. Find the VBOT head bone “VBOT_:Head”
    b. Drag “enemyHealthUI.prefab” onto the head bone *\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\UI*
9. Open the “v_AIController” component on vEnemyAI
    a. Set “Death By” to “Ragdoll”
    b. Set “Current State” to “Idle”
    c. Link the “OnReceiveDamage” event to “CharacterInstance->OnReceiveDamage”
10. Expand the “Melee Manager” events and set
    a. “OnDamageHit” event to “CharacterInstance->`OnSendHit`”

Manual Setup Notes

For both the player and the invector AI, please note that for the conditions prefabs created by the wizard, these are found in the Prefabs/Conditions directory and must be placed under the character root in the hierarchy in a empty game object called “Conditions”.

When adding the conditions you will need to set the mesh of the shape element of the particle effect(s) to the LOD1 body mesh and press Reset to Defaults on the levelling system aka CharacterInstance.cs.

How to Create a Spell

Spells are controlled in two separate places. The magic attack behaviour animator state, which controls spawning options and the friend or foe targeting, and the spell prefab, which contains the projectile, damage, collision, physics, sub spawns and particle effects.

Step 1 Creating the Prefab

1. Create an empty gameObject
2. Attach the following Components in order. Sphere Collider, RigidBody, vObjectDamage, MagicProjectile, Magic Object Damage
3. Attach the particle effect you want as a child of the gameObject.
4. Configure Components (Examples Below)

Alternatively

1. Duplicate and Existing Spell Prefab
2. Rename it
3. Swap the Particle Effect for your Particle Effect

Step 2 Configuring the spell

There are many different types of spells out there. We wanted to create a system that was flexible and had options to do just about anything you can think of. In doing so, we realize that the sheer number of options can be overwhelming. We have created examples for many of the common spells found in games. By playing with both Magic Attack Behaviour's Settings and the Prefab Spells components settings, you can create just about any spell behaviour.

The easiest way to get started would be to duplicate a spell, and then replace the particle effect. [Example Using Fireball Custom]

1. Find Fireball Custom in the project folder and Duplicate it
2. Rename Fireball Custom (1) to whatever your spell will be named
3. Drag the Spell into the Scene
4. Delete All Particle effects and Audio (On Fireball Custom delete all children)
5. Replace them with your particle effect's
6. Replace Fireball Custom Collision with your own Collision effect's

Completed Spells, Condition Effects, Collision Effects, Hand Effects and other prefabs can be found at Assets\Invector-3rdPersonController\Add-ons\ShadesSpellSystem\Spells.

Potential Spell Types

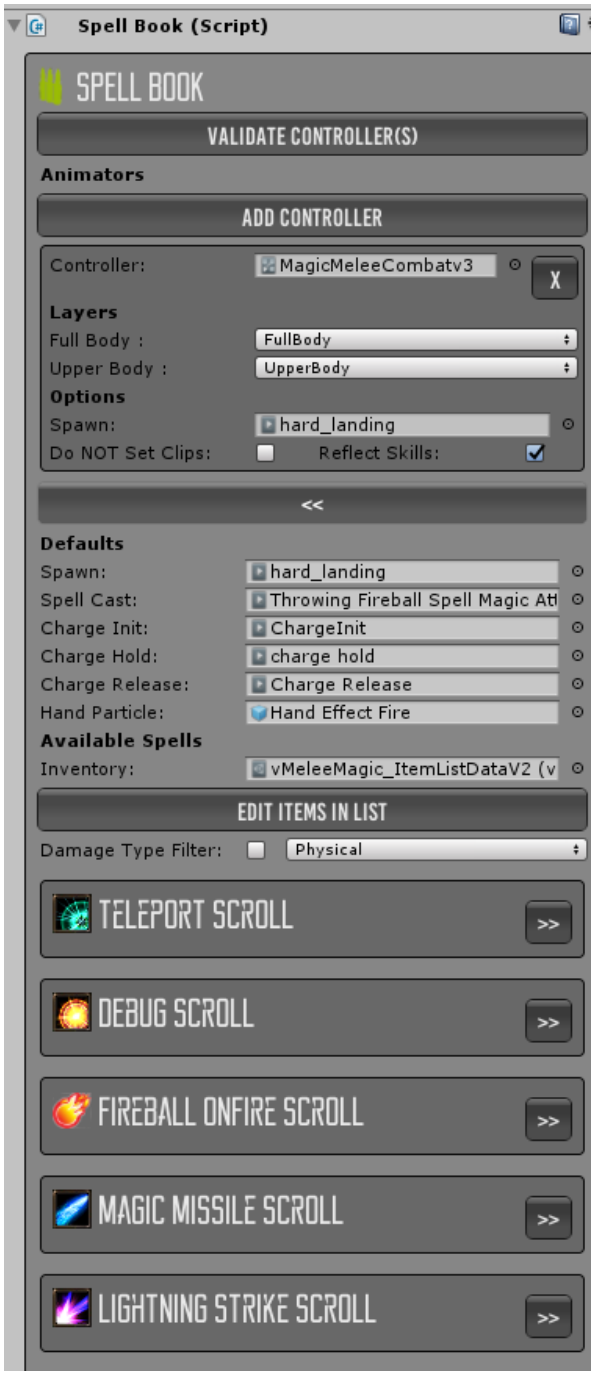
Below is a list of Spells we have already provided, to act as a template for how to create a specific spell type, and what each of the Magic Projectile values do.

Spell Type	Example Spell
Projectile AoE	Fireball OnFire / Fireball Custom
Distance Based AoE	Lightning Strike (check both animator and prefab values)
Point Blank Area of Effect	Frost Nova
Charged PBAoE	Charged Frost Nova
Chain Spell	Chained Lightning
Damage Over Time	Poison Bolt
Projectile PBAoE	Cyclone / Large Cylone Projectile
Multiple Direct Damage	Magic Missile (Spawner contains the projectile Magic Missile v3)
Melee Skill	SpinSlash
Multiple AoE	Meteor (Spawner contains Fireball Custom Gravity)
Grenade	Fireball Custom Gravity Prefab
Homing	Poison Bolt, Water, Magic Missile v3 prefabs
Light Spell	Light
Heal	Heal
Summon	Summon Minions (Spawner holds the AI it spawns and any FX's)
Resurrect	Raise the Fallen
Damage by Proximity	Cyclone Armor
Charged Spells	UpperBody Layer → Magic → Charged Fireball For how to setup Animation States
Random Spawn within a Sphere	Meteor, Magic Missile

How to use the Spell Book to apply animator changes

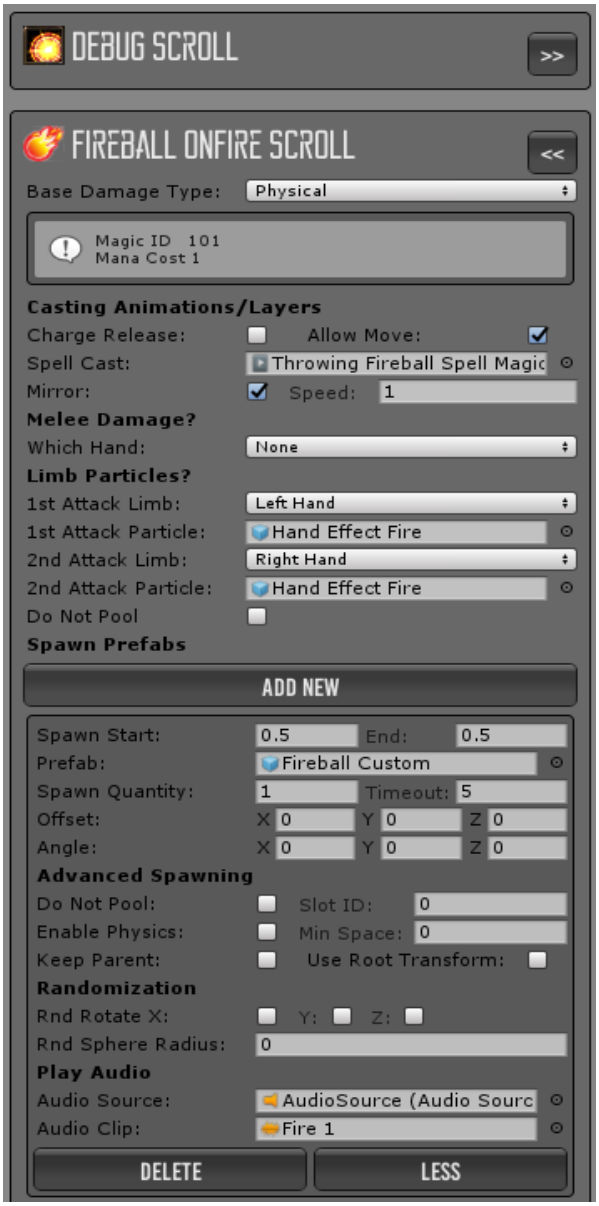
Version 2.1 brings in a new component which automates setting up the relevant animator states on a new controller and validates an existing controller for missing states, spells.

Load the spell system showcase scene and inspect the spell book, add your controllers and your inventory and you will see all the spells extracted.



Update the animation, spawned prefabs, hand effects, same as before.

Expand a spell with the >> arrows and change the settings, these are now using a custom editor that is also shown on the animator states (rather than the previous raw array).



Then press “Validate Controller(s)” and the updated settings are applied to all the linked animators in one step, this is centralised control. Note that on the controller behaviours a new script will be applied “SpellBookAttack” rather than “MagicAttackBehavior” so no existing spells will be affected.

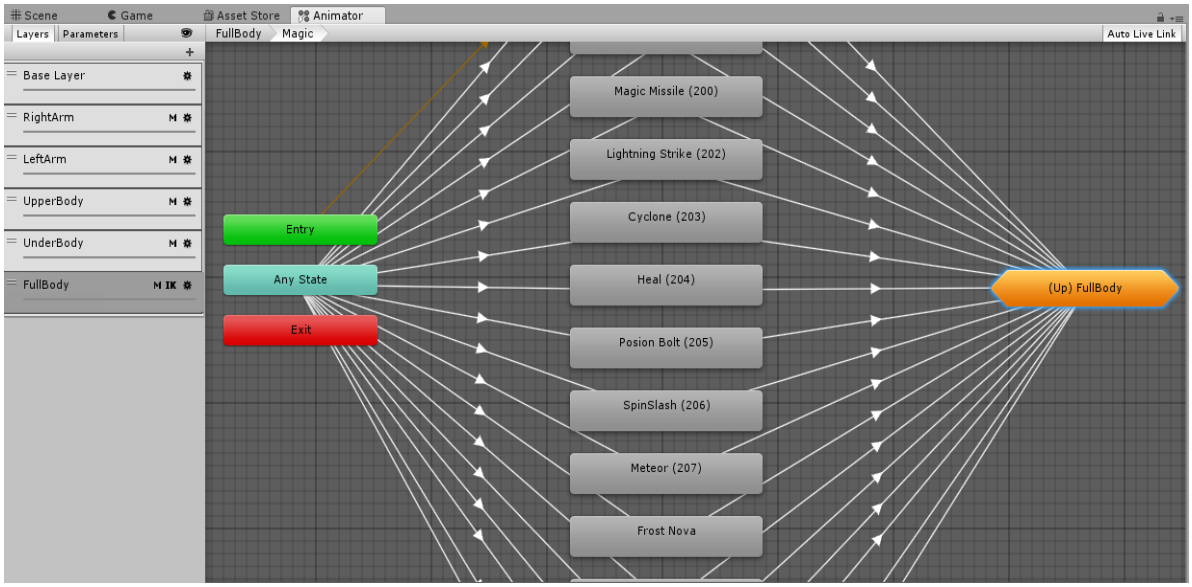
Whilst we were very happy with the way spells could be easily setup on a controller, in our shared game prototype project we found that multiple enemies would often end up needing separate controllers and we needed a way to sync the spell settings between them, which once you get close to 100 spells and 30 different creatures became a problem.

The spell settings are unchanged though are arranged in a slightly different order and the notes regarding setup in the below sections still apply.

To try it out, add some spells into your invector inventory, click the spell book prefab in project view, add a duplicated invector melee or shooter animator controller, add the inventory, set the spell settings and press validate. This will also add the animator parameters and spawn animation state.

Setting Up the Animator (Manual)

Illustration 1: Magic Spells In Full Body Layer



There are 2 layers to use depending on how you want the spell to act.

If you want to just use the upper body for the animations then use upper body. This will allow being able to walk around while you cast spells.

Full Body will use the entire body to animate during a spell cast. If you want spells that can be interrupted, then use Full Body.

Please check out MagicMeleeCombatv2 Animator for a reference of both Upper Body and Full Body Setup. To the right is a image of the Magic SubState in the Full Body layer of the MagicMeleeCombatv2 animator.

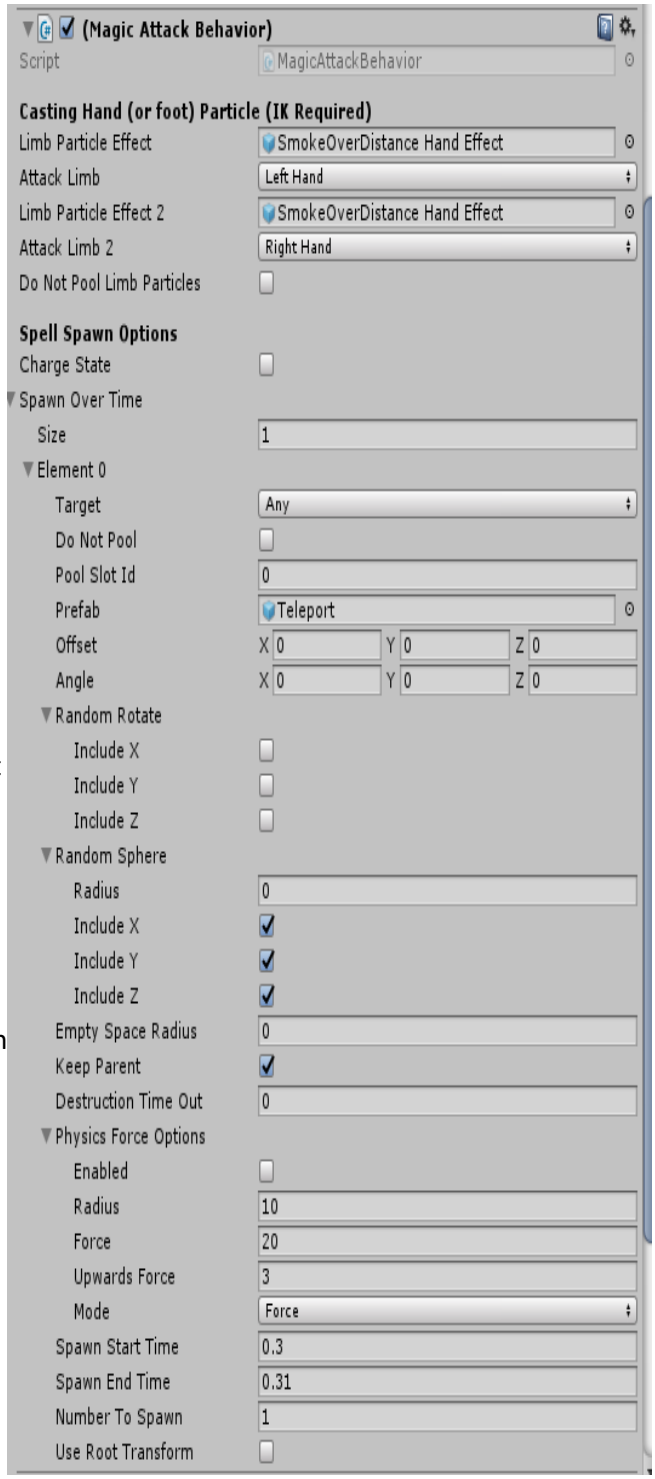
It's important to note that each state needs to have a transition from any state and a transition leading to Null.

When adding spells to the animator, each spell uses a SpellID and MagicAttack trigger.

The animator assigns targets to the spells depending upon the source, so if a player fires a spell then the AI's are automatically targeted and vice versa, the Magic Settings class on the player controls the layers and tags used by the animator.

Add a new Spell to the Animator (Manual)

1. Right click, Create State → Empty
2. Right Click on [Any State] → Make Transition, Drag it to the Empty State
3. Right Click on the Empty State → Make Transition, Drag it to (Up)Full Body → StateMachine → Null
4. Select Empty State Machine and click Add Behaviour. Select Magic Attack Behaviour
5. Under Motion on the Empty State Machine add an animation to use.



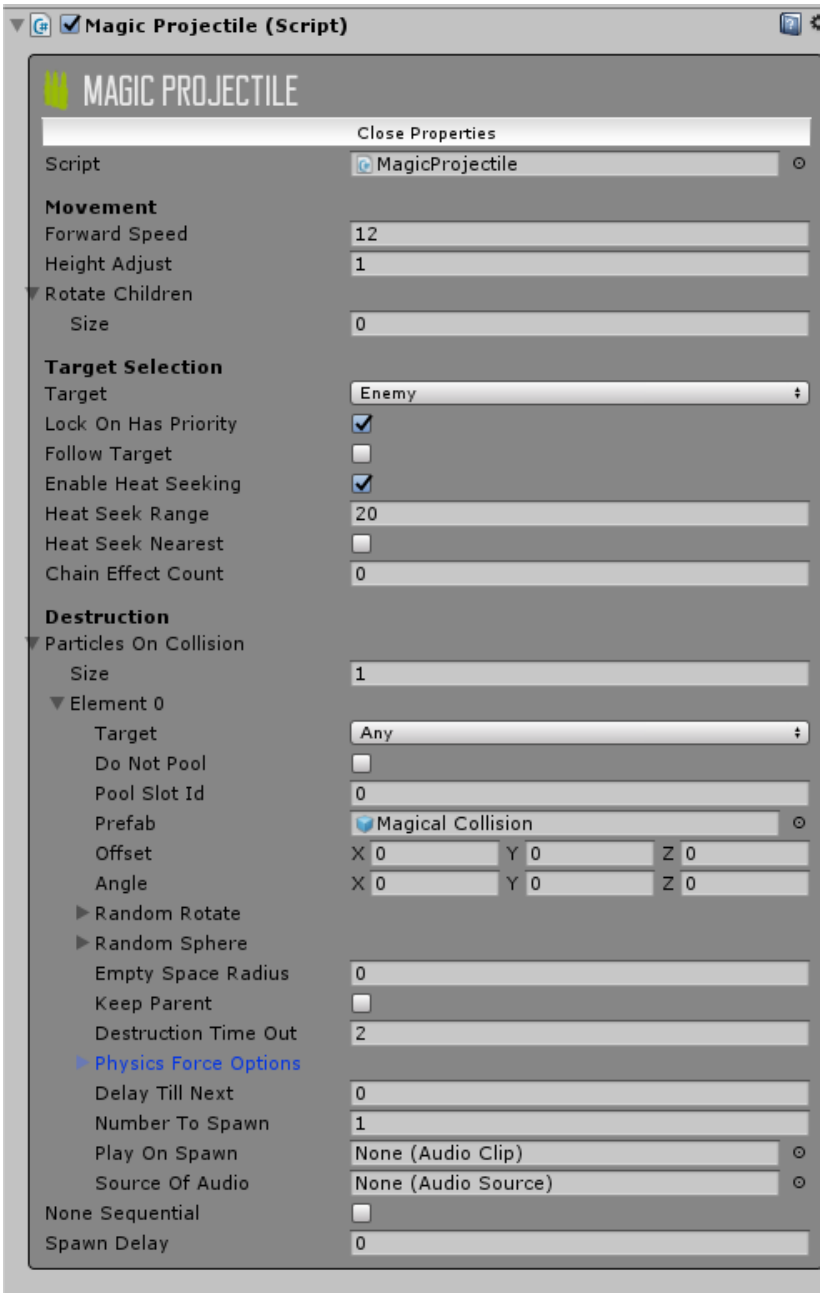
On Transition Entry (the line from Any State to your new Empty State Machine) There is an option in settings “Can transition to self”. Remove the Check if you want the animation to complete before you cast another spell.

See the API (or tooltips) for full notes on each field, the key ones include:

- Limb Particle Effect, this will spawn a particle effect attached to the casters limbs. Import to note that this uses IK and to make work IK must be enabled on the layer.
- Charge state is for a holding spell whilst the button is down, the keep parent option is needed when this is enabled.
- Spawn over time, you will notice a common array in use here and in many of the other scripts. Define as many spawns as is needed here.
- Spawn start time and end time within the animation, note if number to spawn is greater than 1 the spawns are averaged between the two times.
- Prefab is the spell prefab to be spawned, likely from the pooling system
- Pool Slot ID is for when pre warming the pool, set to match the magical pool element id for the spell, this is also used dynamically at runtime when the pool is being filled on the fly.
- Keep parent is needed for charging states and the teleport spell.
- Lastly, use root transform spawns the spell from the root of the character (ie the feet) rather than the magic spawn point which is at hand height.
- Destruction timeout when set to greater than zero will destroy the spell after that time (or return it to the pool), this is for when the spell is fired but doesn’t hit anything.
- Random sphere allows the spawning of multiple projectiles within a random radius with axis restrictions.
- Random rotate adds spin to the projectile, to spin child elements see the MagicProjectile class.

A Quick Look at the Magic Projectile

How has the projectile changed, well, key additions include child rotation, friend/foe targeting (assigned by the animator on launch), curved path heat seeking (should be called tag seeking), multiple spawns and chaining.



You will notice an array that will become very familiar, the spawner options titled here as Particles on Collision.

Same as on the animator magic attack behaviour (though note the missing times as this is the standard variant).

The same set of options will be presented on all scripts that spawn any prefab, this is mainly to allow the pooling behaviour but also has centralised the code.

For any destruction explosion note the destruction timeout allows return of the explosion to the pool. This can also be achieved via the destroy and spawn or magic return scripts.

The heat (tag) seeking provides a curve towards the target, for true homing behaviour enable follow target.

The chain effect, it is listed as a count (which counts down each time this projectile reaches a target). On reaching a target the destruction timeout is reset allowing the particle to keep going until it either doesn't find another target or chain effect count = 0

The height adjust is an original property that allows the spell to target the torso of the character, if left at 0 the feet will be hit.

Adding spells to the Inventory

1. On the Player, go to vItem Manager and click Open Item List
2. Click Create New Item or use the Clone button on an existing spell
3. Name the spell and add an Icon
4. On the drop-down list select Spell (For Scrolls check stackable)
5. Click Add Attribute, Select MagicID and fill in the MagicID you have on the animator
6. Click Add Attribute, Select ManaCost, and fill in the cost for each spell cast
7. Hit Create and you're done!

Nice and easy, certainly, now whilst you are all fully used to invectors inventory, you will note that we have a custom item type that is required of spell.

Another important innovation provided is that as the player and the AI are sharing spell (via the dynamic targeting) we have also provided an item manager (with most of the guts ripped out) for the AI. The purpose is to allow easy assignment of the spells onto the AI's and it looks like this.

Demo Scenes

To make things easier, we have setup a selection of demo scenes that show the core features of the system, accelerating your learning curve climb.

Features_SpellShowcase

Use this scene for playing around, we do. Inside you will find a VBOT all setup and ready to rock, through the door you will find a variant of Sauron, use your wits accordingly.

Spells are found within the two chests, when testing your own spells add them either directly onto the characters start items or into the chests (our choice).

You will also find Shade's complete tease of a bow and throwing stars, these really demonstrate the numerous applications of the magic projectile, want to impress us, video some fire arrows, can you do it?

When developing spell note that the fastest way is to use the testing animator state.

Original Levelling System

This was out starting point before feature creep took over and turned the levelling system into something akin to DnD (almost, maybe later). Useful if you're after a clean starting point for your own levelling system, this is not in active development.

MenuTest_Lobby

Now this comes in two variants, this is because an abstract data layer is in place. Why is it abstract, this is so that the levelling system can talk to different datasources without knowing whether it is saving to SQL or xml.

Two data connectors have been provided, SQLLite (included for free in the project) and EasySave2, due to the abstraction there is little advantage between the two and either may be used.

Now the lobby scene is an example of an actual game, on run pick new game, name and choose your base character axis, alignment, race and class and the lobby scene will load level1.

You will notice the structure persists all needed components (including the camera, inventory, player and the main menu) from the lobby scene to the level 1 scene.

Go open the chests to get your spells and provided magic weapons, now press Esc and Save, then stop the scene from running.

Hit play again and you will see you can now choose a game to load or continue, hit continue and level 1 is loaded with all equipment and spells as you left them.

Now run into the room, kill the enemies, you will notice many of them drop gold and shrooms, collect as you will. Notice the Magical Pool in the hierarchy being filled as spells are needed.

Now go through the portal at the end of the room, this causes level2 to be loaded, keeping all of your equipment, this also causes an autosave.

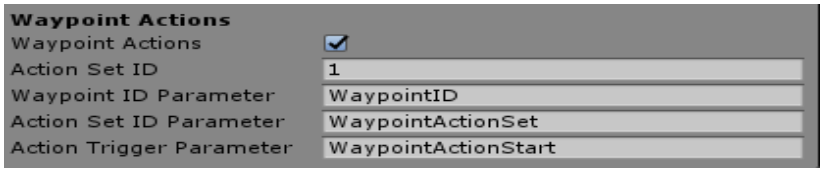
Features_WaypointActionSets.unity

This demo shows a feature test that works by sending the current invector waypoint ID to the animator and triggering the animator when a waypoint is reached.

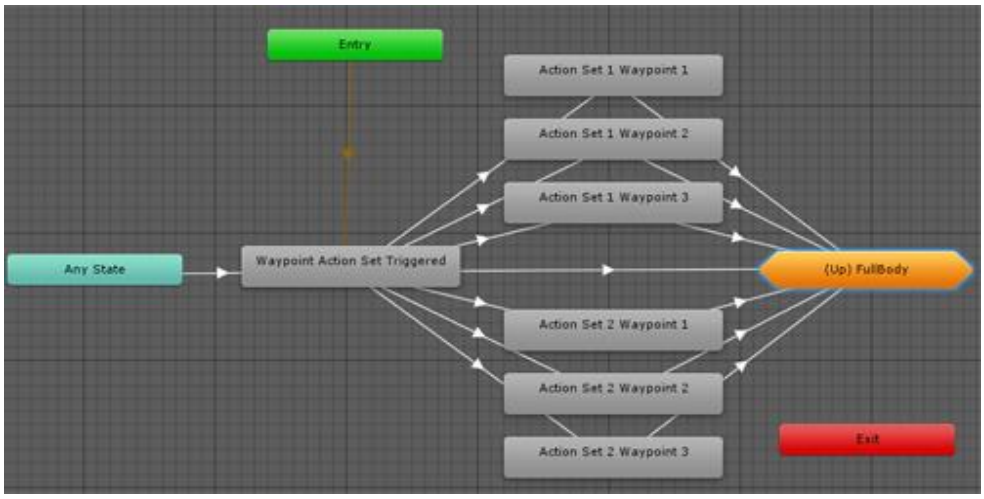
The net effect is that at each waypoint a different animation is played by the animator, think chopping wood, or fetching water from a well.

In the provided scene, you will find 5 VBOT's doing a different dance at each vWaypoint, the dances have been split into two sets, WaypointActionSet1&2 with the bots performing the relevant dances from the two sets at each of the three invector waypoints.

The settings to enable this are in the MagicAI component, under waypoint actions on the VBOT.



In the full body layer of the animator you will find the listed triggers in use in the waypoints state machine.



Which is fed by the following triggers and ID's

Features_GenericAI.unity (Experimental)

This scene shows the results of an experiment to use the invector AI on a generic rigged iguana, note that the animator is only partially complete and at the time of writing requires root motion animations (invector's later releases will include support for AI with non-root motion).

Lets take a look, running the scene you will find that the iguana is rather larger than you would want to meet and also breathing fire, nasty, well we don't provide magic for no reason hero, sort it out.

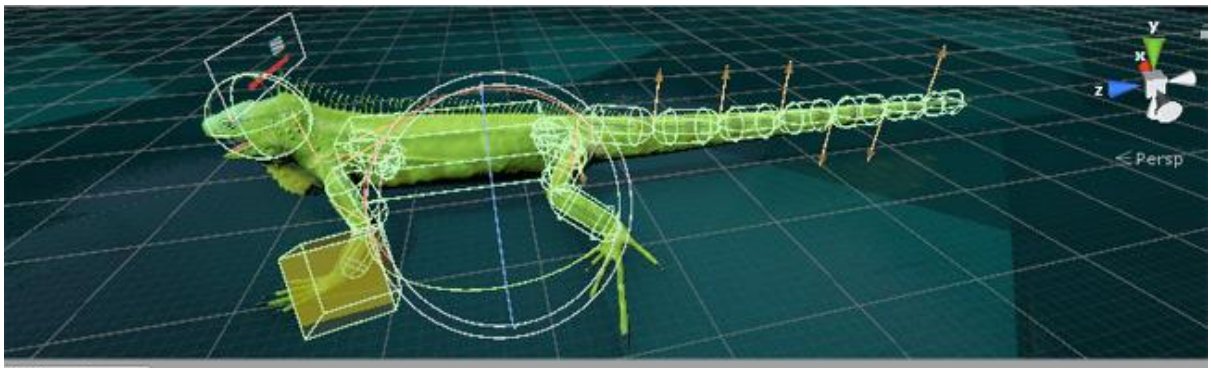
Now if you look at the iguana gameobject you will notice two things, the Generic Ragdoll System and Generic RIG Controller scripts.

The Generic Ragdoll is a clone of the invector one with most of the humanoid bone grabs swapped for the properties on the main script.

The controller is literally an inherited vAIController with one extra property and an update to the constructor to fix and error.

Now how did we get the ragdoll you might ask, well this was before invector released the generic template to their ragdoll builder, so at the time a script was built that created linked bone chains, allowing ragdoll activation.

See the reorganise helper documentation, but here is a teaser.



ReOrganise

Bone Mass 10

Toggle Hitboxes OFF

Inc	Root Bone	Link Bone	Chain Start	Chain End	Del
☐ 01	Root	Root Bone	Pelvis (Transform)	Pelvis (Transform)	
☐ 03	Root	Root Bone	Spine.1 (Transform)	Spine.3 (Transform)	
☑ 07	Root	Root Bone	Tail.1 (Transform)	Tail.7 (Transform)	x
Tail.1 (Transform)			Capsule		
Tail.2 (Transform)			Capsule		
Tail.3 (Transform)			Capsule		
Tail.4 (Transform)			Capsule		
Tail.5 (Transform)			Capsule		
Tail.6 (Transform)			Capsule		
Tail.7 (Transform)			Capsule		
☑ 02	Root	Root Bone	Thigh_L (Transform)	Calf_L (Transform)	x
Thigh_L (Transform)			Capsule		
Calf_L (Transform)			Capsule		
Foot_L (Transform)			Dont Include		
☑ 02	Root	Root Bone	Thigh_R (Transform)	Calf_R (Transform)	x
Thigh_R (Transform)			Capsule		
Calf_R (Transform)			Capsule		
Foot_R (Transform)			Dont Include		
☑ 02	Root	Root Bone	UpperArm_L (Transform	Forearm_L (Transform)	x
Clavicle_L (Transform)			Dont Include		
UpperArm_L (Transform)			Capsule		
Forearm_L (Transform)			Capsule		
Hand_L (Transform)			Dont Include		
☑ 02	Root	Root Bone	UpperArm_R (Transform	Forearm_R (Transform)	x
Clavicle_R (Transform)			Dont Include		
UpperArm_R (Transform)			Capsule		
Forearm_R (Transform)			Capsule		
Hand_R (Transform)			Dont Include		
☑ 01	Root	Root Bone	Head (Transform)	Head (Transform)	x
Neck.1 (Transform)			Dont Include		
Neck.2 (Transform)			Dont Include		
Head (Transform)			Sphere		
☐ 03	Root	Root Bone	Toe_L.01 (Transform)	Toe_L.03 (Transform)	

Features_ReOrganiseCharacter.unity (simplyGon handling)

This scene demo's the workflow possibilities of the ReOrganiseCharacter editor window, originally written to handle SFBay characters being sold with multiple LOD levels, each with their own set of bones/animator (simplyGon output) and multiple materials/equipments across those LOD levels.

This script allows child name cleanup, LOD level merging (producing a LOD group and multi LOD levels working from one set of bones), generic bone ragdoll creation and multi LOD level character equipment handling.

So, when the scene is loaded you will find two rows of hobgoblins, lets work from left to right:

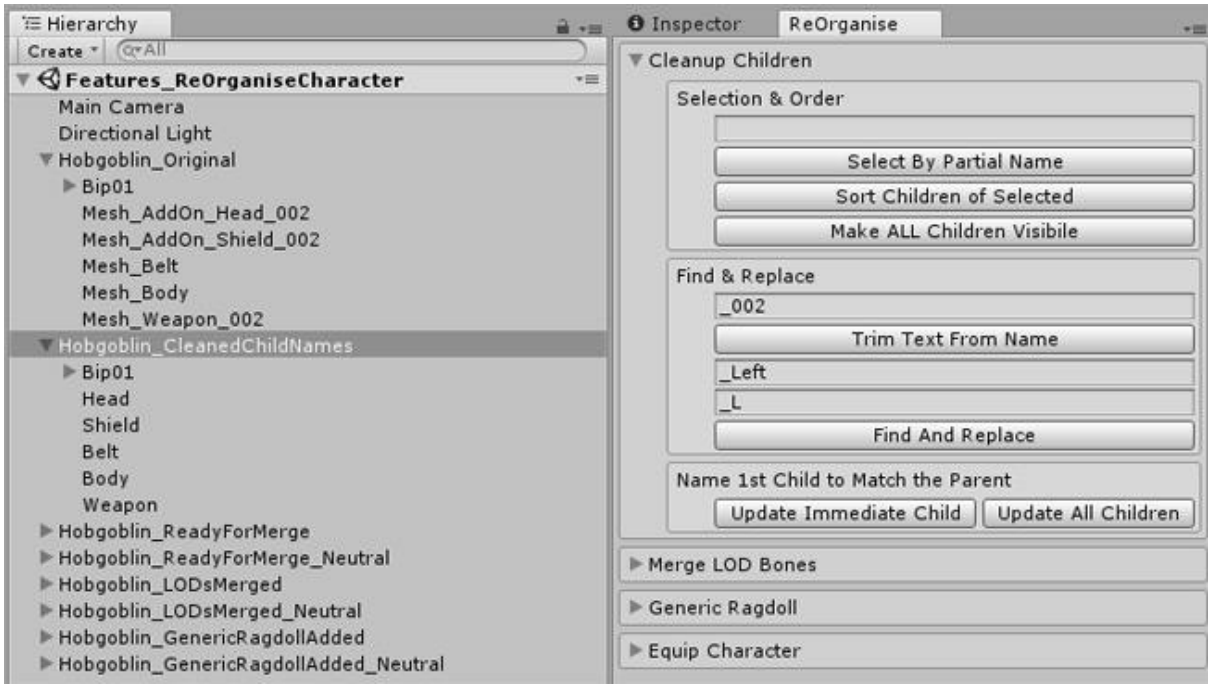
Hobgoblin_Original

This is, well the unmodified original model found for free on the asset store.

Hobgoblin_CleanedChildNames

As the name suggests, first (optional) step is to sort out the child names on a new model, on the Invector menu load the ReOrganise Character editor window, if you select the cleanup children tab you will see you have options to select by name, sort children of, make all children visible, find and replace and update child name to match the parent.

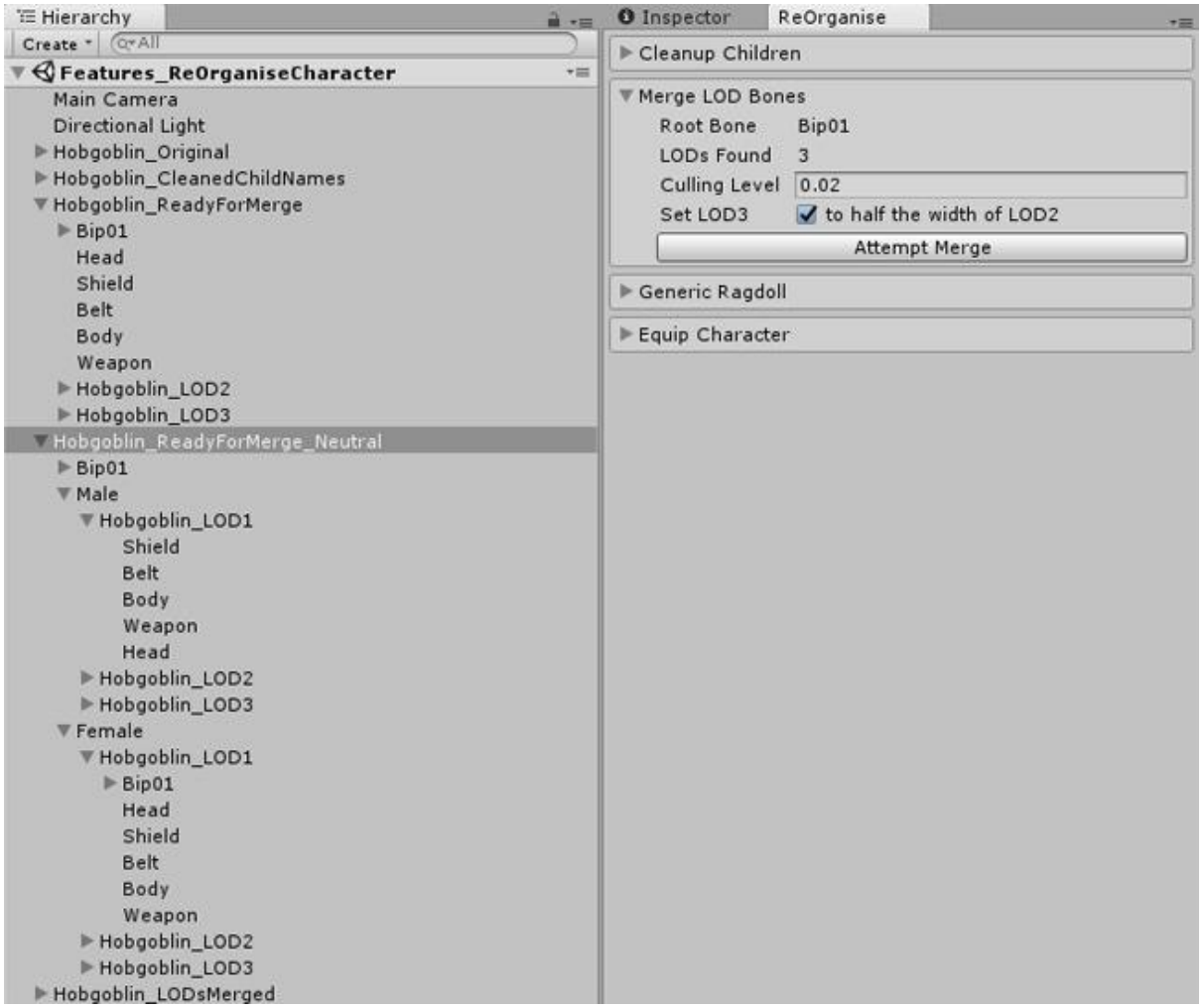
In the case of the hobgoblin, it would have been fairly quick so rename these by hand, however if you own a complex model, eg SFBay Human Barbarian, suddenly renaming a large volume of equipment from two genders becomes a pain.



Hobgoblin_ReadyForMerge

Now this is where things get more interesting. What we have here is the result of running our hobgoblin through simplygon, outputting three LOD levels.

You will notice that the hobgoblin on the row behind is gender neutral (can be male or female), in both cases the LOD1 hobgoblin has been dragged into the scene, then the LOD2&3 have been attached as children of the LOD1.



Note to create the gender neutral hobgoblin, the male LOD1 was dragged into the scene, two empty child objects of Male & Female were added, then all the male LOD1 equipment was placed into Male/Hobgoblin_LOD1 empty gameobject. Then the male LOD2&3 prefabs and the Female LOD1,2&3 prefabs resulting in the structure above.

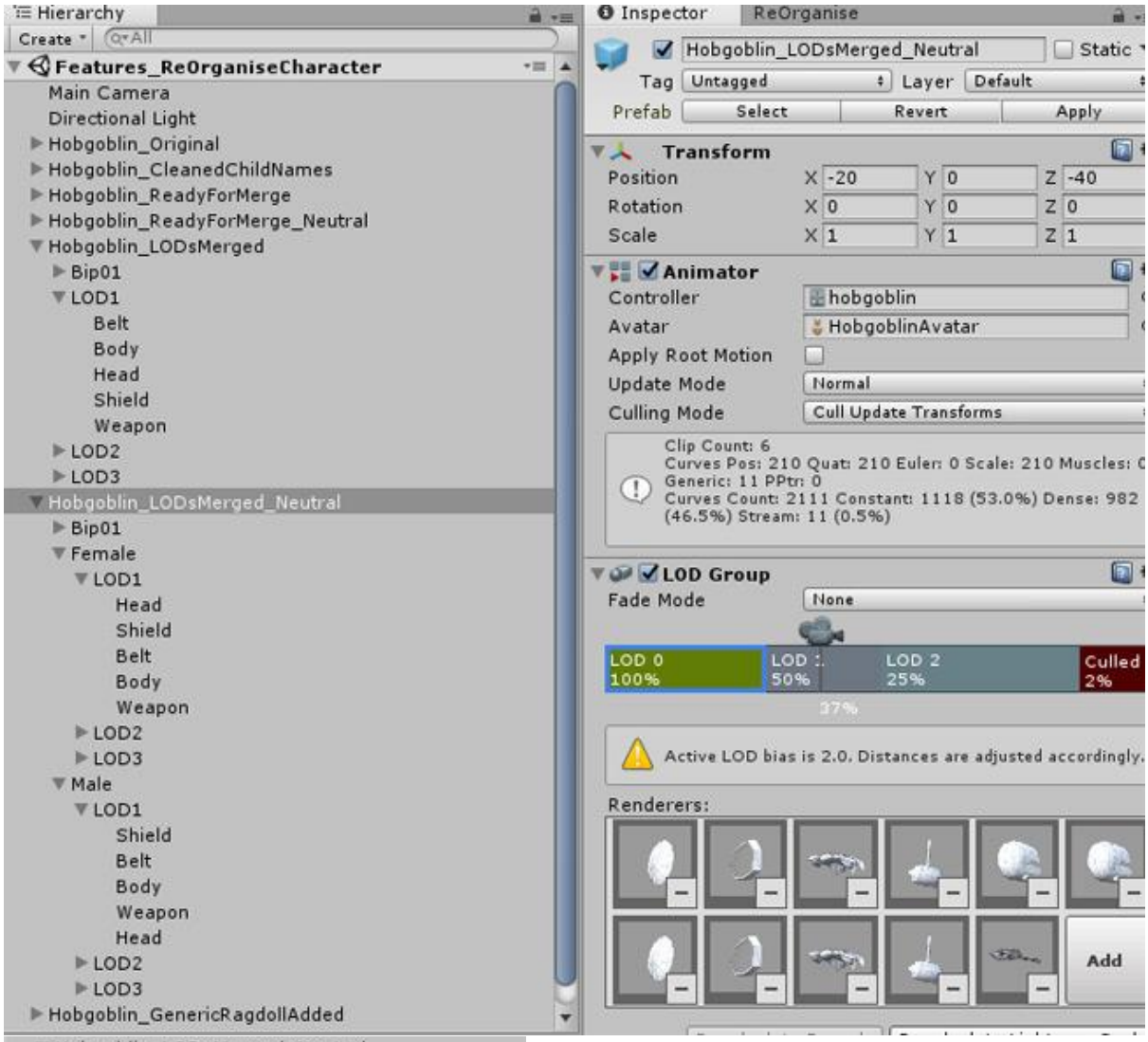
Note simplygon has been bought by Microsoft and is free for indie developers to use, to see what simplygon has output, see the folder LODs\Characters\TSWHobgoblin\Hobgoblin_20170927_004943

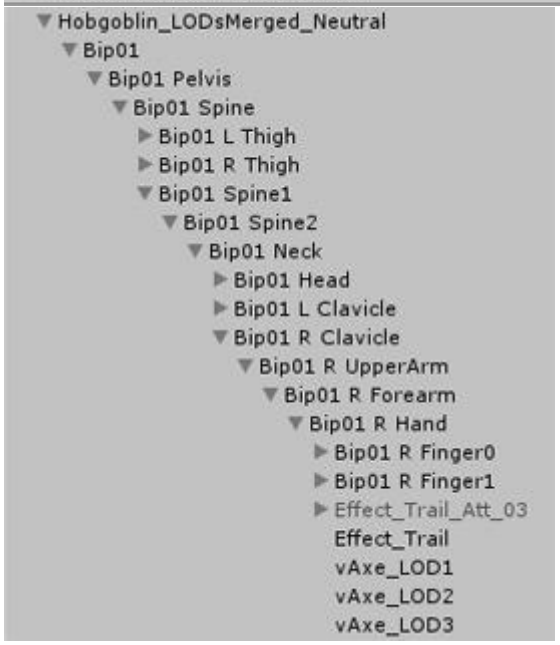
Now, in the reorganise window, change the tab to Merge LOD bones, select the character and press analyse and you will get the above display, showing the number of LOD levels found and the root bone.

The option Set LOD to half the width of LOD2 affects the output LOD group, on a high poly character, I have LOD1-5 set to 100,75,50,25 & 12.5 in the LOD group. The LOD group is auto calculated and this option creates the last group at 12.5, if disabled you would get an even split 100,80,60,40,20.

Hobgoblin_LODsMerged

This hobgoblin shows the result of pressing the Attempt Merge button on both single gender/gender neutral versions, lets take a look





As you can see the resulting output is clean, with one skeleton (rather than 3 or 6), one animator and all equipment/bodes for all LOD levels neatly structured and attached to the single skeleton.

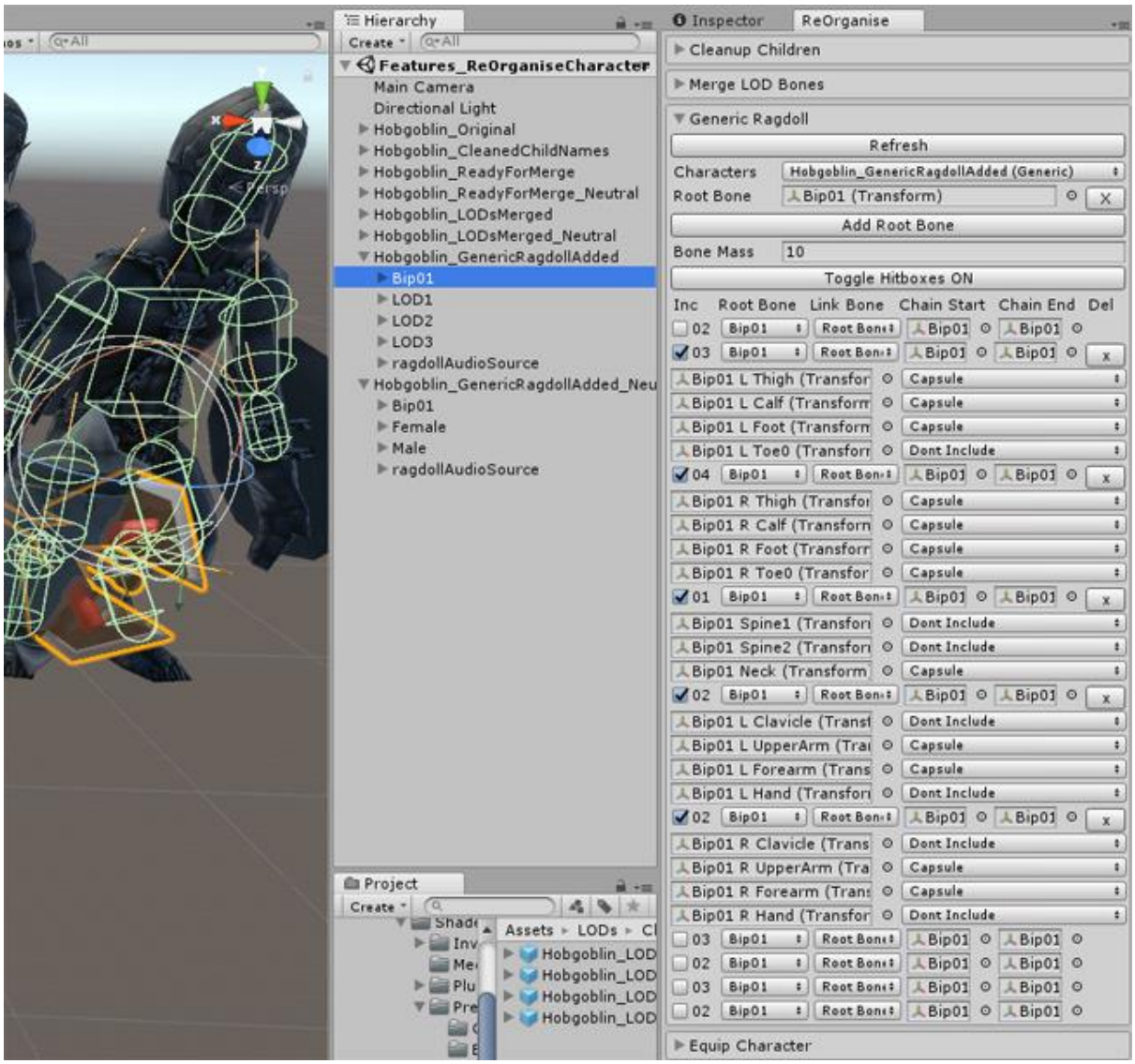
Looking at the LOD group you will see all meshes are added and the scaling is set already.

Last thing to note, is the vAxe, expand the bone structure and you can see that the mesh on the bone structure that had been run through simplygon has also been merged onto the single skeleton and added into the LOD group.

Hobgoblin_GenericRagdollAdded

This shows the ragdoll creation abilities that were coded before invector added generic ragdoll ability, however it still has some use for custom bones (eg hair) or where the invector ragdoll is not producing desired results.

How does it work, well, it scans the skeleton and produces bone chains, you simply tick which bone chains to include, and which bones/collider type to use from that chain. These chains are all linked back to the root bone, or to another bone chain.



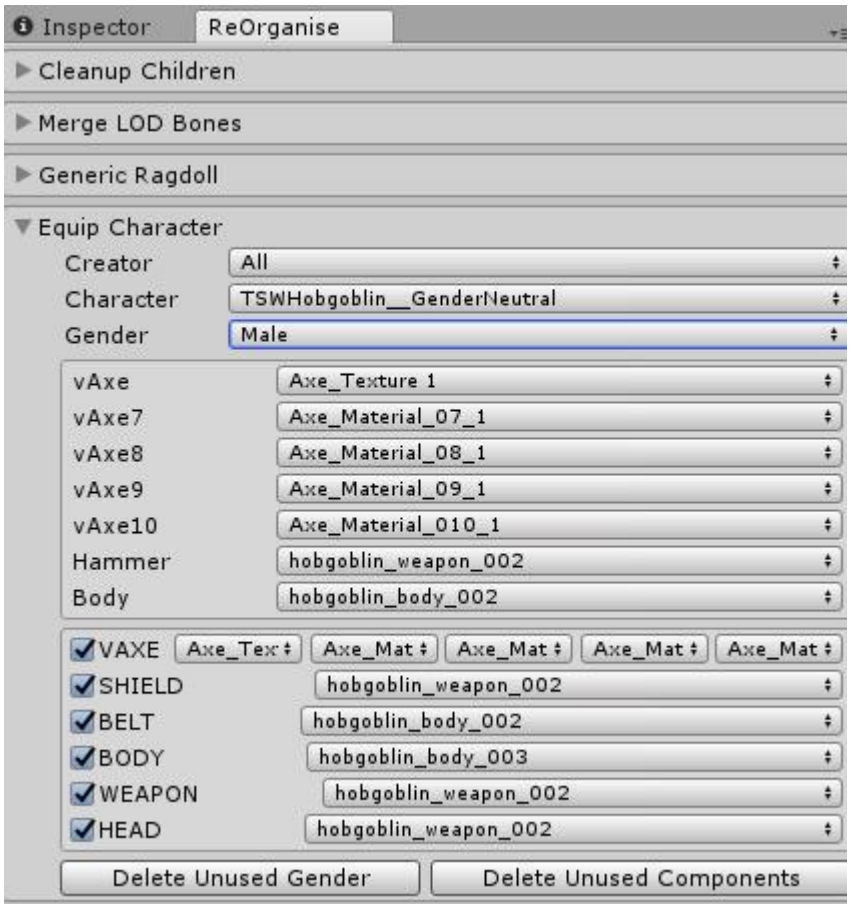
The invector ragdoll, collider and joint components are added on all included bones within a ticked bone chain.

Note what this script does not handle (and why for the most part use invectors auto ragdoll wizard) is the joint constraints, if anyone can see a way to calculate these, that would be impressive.

Equip Character

To demo the last function of the reorganise character script, create a new scene, load the editor (Invector->ShadesSpellSystem->ReOrganise Character).

Now change the tab to Equip Character and select TSWHobgoblin_GenderNuetral from the character dropdown list.



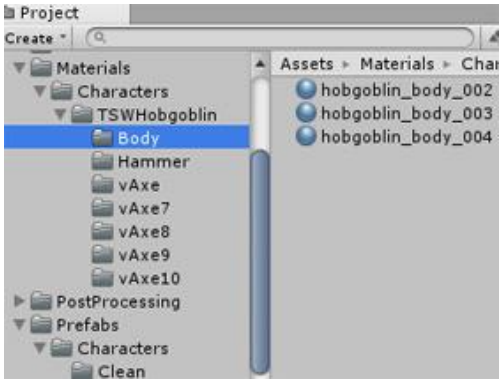
So what do we have here? The hobgoblin got loaded into the scene (from Prefabs/Character folder) and you can see a list of all body parts with the respective materials but also a distinct list of materials, this is so that when multiple body parts share a material, the material can be swapped (via the dropdowns) in one go.

Now hang on your thinking, I can easily just go and swap the materials by hand, well yes this is true, however imagine you had 5 LOD levels and 20 body parts, that is going to take awhile right, that is where this script comes in.

Apart from material swapping, it also allows the enabling/disabling of equipment across the LOD levels via the checkboxes and the swapping between the two genders.

The buttons on the bottom do as they are labelled and are optional, basically they remove the unwanted gender or equipment's from all LOD levels and the LOD group.

Now for a more complex example, here is SFBay's Human Barbarian, with 2 genders and an excessive amount of equipment.



So much equipment I had to take two screenshots, this is the character, that this entire script (apart from the ragdoll tab) was built for, it was just taking hours to adjust materials on equipment and enable the armour I wanted.

Important, note the folder structure is important, prefabs need to be in the prefabs/character/clean or prefabs/creatures/clean folder and the materials need to be in a separate folder per body part to enable swapping.

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