Animation Setup

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Feature Overview

Skinless Skeletal Mesh

Attachment Attacher

Portrayals

Skinless Skeletal Mesh

Problem: Unreal Engine requires a skeletal mesh for skeletal animation.

- Makes a character’s animation dependent on a mesh
- We want to animate a skeleton on its own

Solution: Generate a skeletal mesh with skeleton data only.

- Separates responsibilities of skeletal meshes and skeletal animation
- Character can have zero meshes and still animate

Attachment Attacher

Problem: There is no workflow for putting together modular characters.

- Inconsistent character mesh setup

Solution: Make a component for assembling character attachments.

- Centralizes mesh setup functionality
  - Easy to maintain
- Scalable for online multiplayer
  - E.g., replicating cosmetics

Portrayals

Problem: You can’t make a character look good for both first and third person.

- Difficult to animate
- Limited creativity

Solution: Workflow for portraying actor components uniquely to different views.

- Multiple actor components for a single representation
  - Each one associated with a portrayal tag
- Gives creative freedom to artists

Challenges Overcome

Generated Skeletal Mesh Storage

Custom Primitive Scene Proxies

Challenges Overcome

Generated Skeletal Mesh Storage

- Where do we generate the skinless skeletal mesh for a character?
  - Solution: Generate the skeletal mesh when Unreal Engine loads our character class
- Where do we store this generated mesh?
  - Solution: Store it on character class (on the class default object)

Challenges Overcome

Custom Primitive Scene Proxies

- Unreal Engine’s primitive scene proxy system has restrictive design
  - Solution: Store custom functionality and configuration on a subobject
- Primitive scene proxies require a corresponding component class
  - Solution: Provide example primitive component implementations that are functional but not required

Future Enhancements

Skinless Skeletal Mesh

Portrayals

In-Editor Workflow

Future Enhancements

Skinless Skeletal Mesh

- Skeleton’s animation gives a consistent performance hit
  - Idea: Conditionally animate based on bounding box in view

Future Enhancements

Portrayals

- Portrayals cannot be applied to trees of attached scene components
  - Idea: Make a workflow to address this
  - Idea: Redesign portrayal system to account for this

Future Enhancements

In-Editor Workflow

- SkinlessSkeletalMesh and AttachmentAttacher components must be made in native code
  - Fix: Fix crash when trying to use these as blueprint-added components
- Configuring the PortrayalAssignment component in the blueprint is complex
  - Idea: Use FProperty pointers instead of FComponentReference’s

Thank You!