1ST AND 3RD PERSON ANIMATION

APPROACH PROPOSAL

ORIENTATION: 1ST & 3RD

Key Terms: - also see NottsPF assets/production/tech/CW2_AnimationGlossary.pptx

Aim Pose

- Also known as *UBIKS* or *Aim Screen*
- An animation - of 9 key poses in Crysis's case - pointing the weapon in a range of directions that can be blended between to give an exact pose for any given angle (within its limits).

Animation Overlays

- Layering one or more animations on top of a base animation
- Typical case: to play a gun reload over the top of a walking animation

Overwrite Overlay

- An overlay that overwrites the joints in the base animation, replacing them entirely

Blend Overlay

- An overlay that replaces joint transforms with the interpolated result of its own and the base values

Additive Overlay

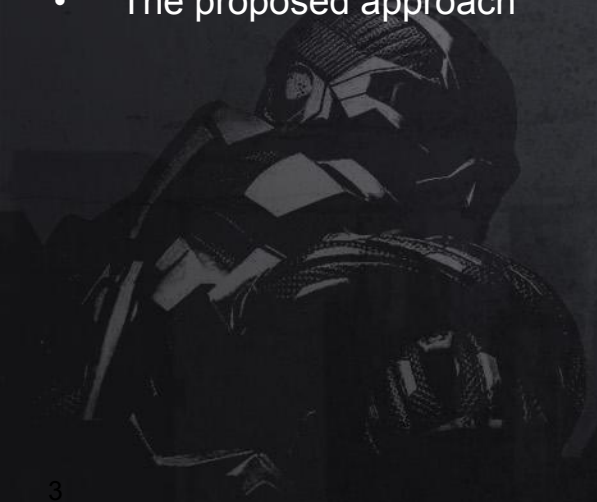
- An additive animation is one that has been processed such that its joint rotations are relative to an initial pose
- An overlay animation that appends its joint transformations to those of the base animation

POSSIBLE APPROACHES: 1ST & 3RD

Combining the two
- Shared skeletons
- Most animations shared
- The approach in the FF component system

Traditional System
- Separate skeletons
- Separate animations
- The old Crytek and FRD solution

Combining the two with a 1st Person bridging layer
- Shared skeletons
- Limited animation sharing
- The proposed approach



COMBINING THE TWO: 1ST & 3RD

In the current implementation the 1st Person view uses the 3rd Person skeleton and most of the animations

An Aim Pose is used to direct the 1st Person arms in conjunction with a procedural offset on the shoulders to position them better in the camera view

Good

- Facilitates world interactions
- One animated character
  - Simplifies code
  - Less animation processing
- Can share animations
- Shadows match the arms

Bad

- We are compromising the quality of the 1st Person Animations
  - 1st Person is far and away the most important as it is typically is about a quarter of the screen
- The Aim Pose causes artefacts
  - Interpolation on the Aim Pose itself
  - Overlaying additives onto the Aim Pose causes problems as the basis for those animations is changed
- High tech IK solutions to resolve these overlaying issues
  - Animators have less control and there is less correlation between Max and in-game
  - Cost and fragility of the system
- In practice the animation sharing is in fact fairly limited

TRADITIONAL APPROACH: 1ST & 3RD

Two characters: a pair of floating camera mounted arms and a separate 3rd Person character for the legs & shadow casting

Good

- Total animator control over the look of the 1st Person animations
- Having no Aim Pose or additive overlays removes artefacts
- Low tech solution
  - Cheap, less potential for issues

Bad

- Shadow doesn't match 1st Person arms
- 2 characters running in parallel
  - Code complexity
  - Extra animation processing
  - Have to ensure the two are running in parallel
- No ability to share animations
- Interacting with the environment is difficult
- The old style system would need rewriting in the component system
  - Repercussions for CXP

A THIRD WAY?: 1ST & 3RD

Suggested Approach

- Accept that wholesale sharing of animations is not going to work
- Don't expect to use 3rd Person animations in 1st instead consider use of 1st Person animations in 3rd
- Drop the use of a full Aim Pose for aiming in 1st Person
- Use a torso only Aim Pose (animated or procedural) to interface between the 3rd and 1st Person
    - Effectively this would lock the arms to the camera so that they can be animated in a traditional way

A THIRD WAY?: 1ST & 3RD

Good

- Facilitates world interactions
- Total animator control over the look of the 1st Person animations
- Low tech solution
  - Cheap, less potential for issues
- Can share animations
- Fits closely to the existing component system

Bad

- Arm animations cannot overlap the joints used by the torso Aim Pose i.e. Spine3 and below
  - But this is a constraint the animators are use to working with

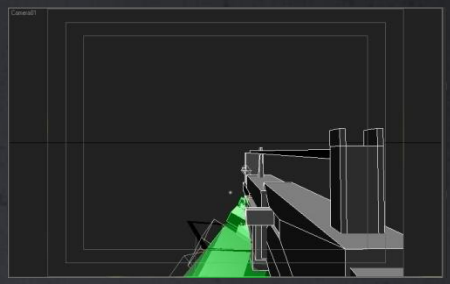
Unknowns

- Can we use the 1st person character to cast shadows?
  - Would allow us to drop the second character for the client
  - Would ensure that the shadows matched the limbs in the 1st Person view
  - Dependent on whether the shoulder breaking is within reasonable limits
- Can a dampened version of the torso Aim Pose be used to allow sharing of overlaid actions?

VISUALISATIONS: 1ST & 3RD

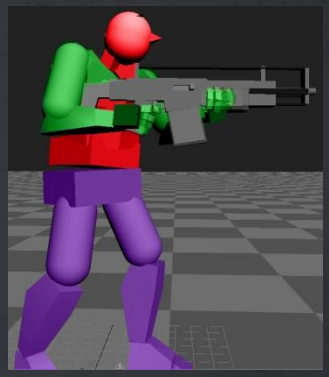
1st Person Aiming – The player's view

Standard 1st Person view - all bones are Screen Space.



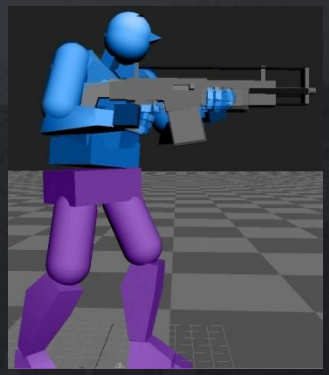
1st Person Aiming – Side shot

Shows the animations used in the 1st Person View, but from the side. Leg bones are Locomotion, spine is modified by a Torso Aim Pose and arms are Screen Space



3rd Person Aiming

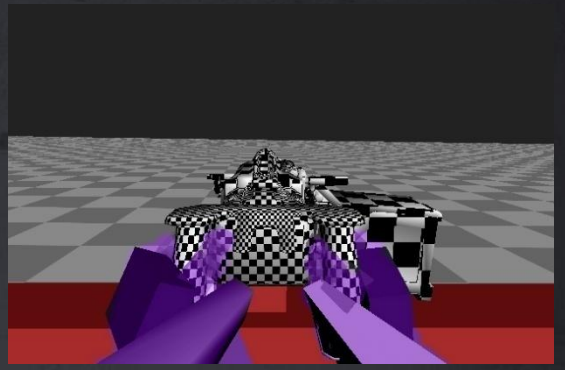
Shows a char aiming a gun in 3rd Person leg bones are Locomotion, torso and arms are Aim Pose.



VISUALISATIONS: 1ST & 3RD

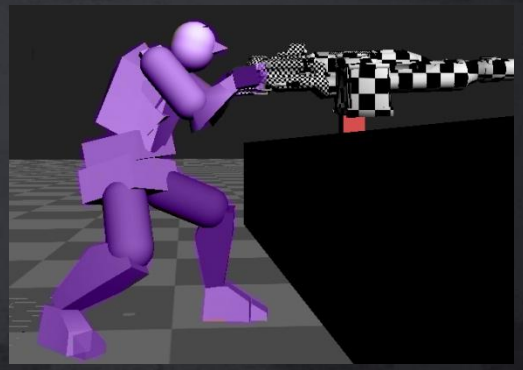
Object Interaction

Shows an object interaction in FP, animation is now played in World Space to make world interactions possible.



Object Interaction

Shows an object interact in TP , all bones are World Space.



VISUALISATIONS: 1ST & 3RD

3rd Person reuse of 1st Person Reload animation with torso Aim Pose

- A possible extension to the system to allow FP animation reuse in TP.

Shows a char aiming a gun in TP: leg bones are Locomotion layer, the spine is a less extreme version of the Torso Aim Pose to look better in TP, arms are Screen Space.

Afterward we blend back to TP Aim Pose and Locomotion layers.

ENQUIRY ONE: 1ST & 3RD

Test 1st Person torso Aim Pose

Goals

- Establish whether the torso Aim Pose is viable for 1st aiming
- Assess impact on shadows
  - Is a separate 3rd person pass for shadow casting definitely necessary?
  - How much do the shoulders need to be ‘broken’ to make the animation viable?

Assets

- An arm pose for holding the weapon
- Sample actions: Reload and melee

Code

- Implement code-driven torso Aim Pose
  - Point the spine using FK with a feathered blend percentage down the chain
- Implement action animations as non-additive overlays

ENQUIRY TWO: 1ST & 3RD

Test world interaction

Goals

- Establish whether the system handles blending out to a full body animation

Assets

- A full body animation

Code

- Implement blending out of the Torso Aim Pose
- Implement full body animation

ENQUIRY THREE: 1ST & 3RD

Test 3rd Person torso Aim Pose

Goals

- Establish whether the torso aim screen is viable for 3rd person actions
  - Can we share the arm animations for actions between 1st and 3rd?
  - Would a dampened version of the torso Aim Pose look reasonable in 3rd?
    - There would be some settling back to the base pose

Assets

- An alternative torso Aim Pose
  - With reduced impact on the spine

Code

- Implement use of 3rd person torso Aim Pose
- Implement selection and blending between Aim Poses