Hazumu

Raytracing Skeletal Animation with DXR

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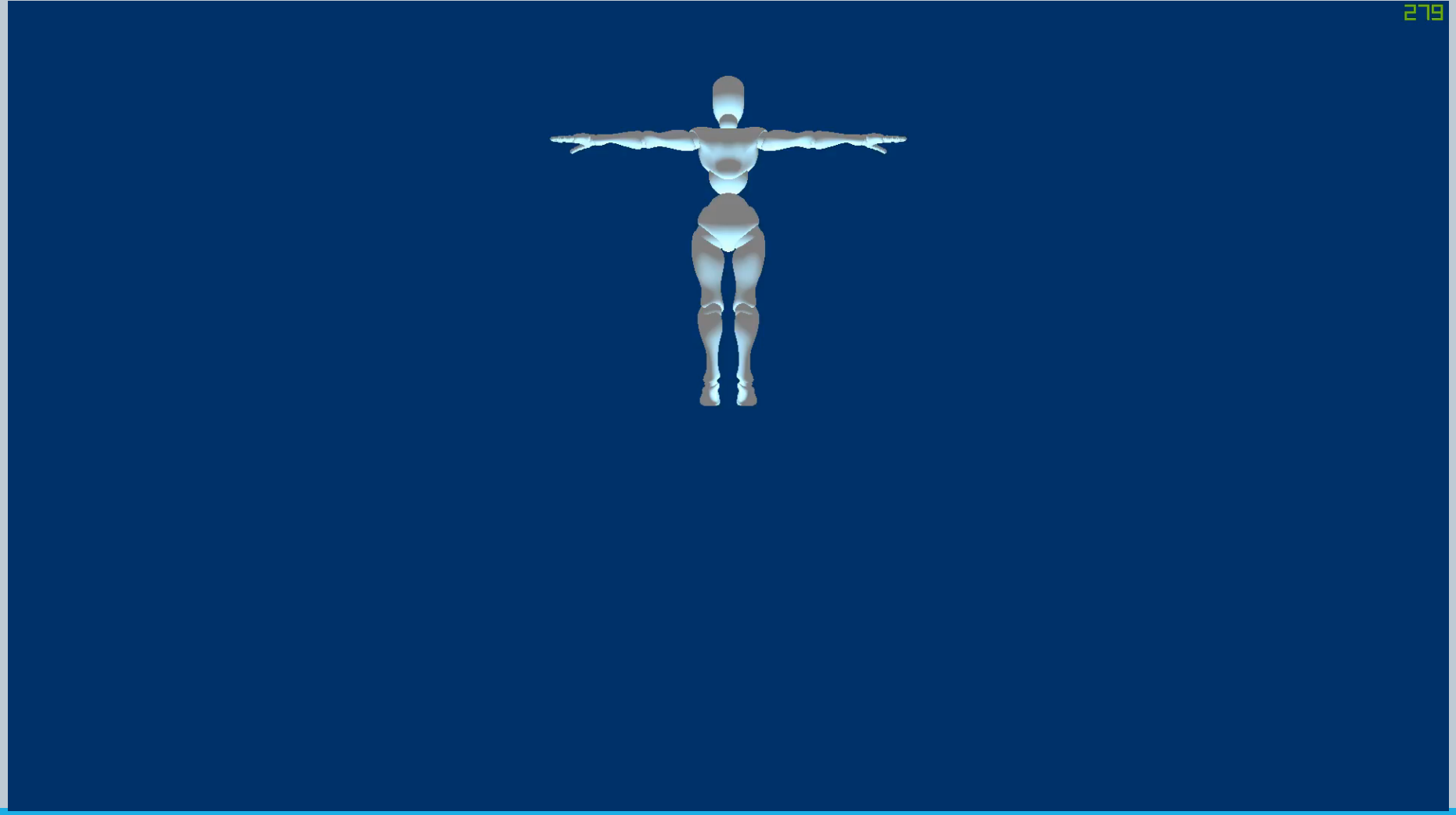
Skeletal Animation

- In rasterization, done in the vertex shader
- Each vertex has its own extra transformation based on the skeleton
- Don’t have this option in ray tracing
- Have to move skeletal transformation to application
- Have to rebuilt or refit acceleration structure

Current Progress



Loading .fbx files with skeleton and animation data

Loading Animation Data

Preprocess: for each vertex, find the joints that influence it and store it in the vertex's bone data

Used Assimp to load FBX files with animation data

FBX files have joint positions written for each frame over a duration

Recursively recompute each joint's world transformation from the skeleton

- Must interpolate the joint transformations between the time steps
- Multiply out the transformations in Scale * Rotation * Translate (because of right handed coordinate system)

Milestone 2

- Skeletal transforms done in compute shader
- Refitting acceleration structure per animation update

Milestone 3

- Custom Skinned BVH
  - Use joints to deform the BVH bounding boxes
  - As of now, not sure if DirectX API will allow for custom acceleration structures – need to do more research