RTX-Explore

DXR Path Tracer

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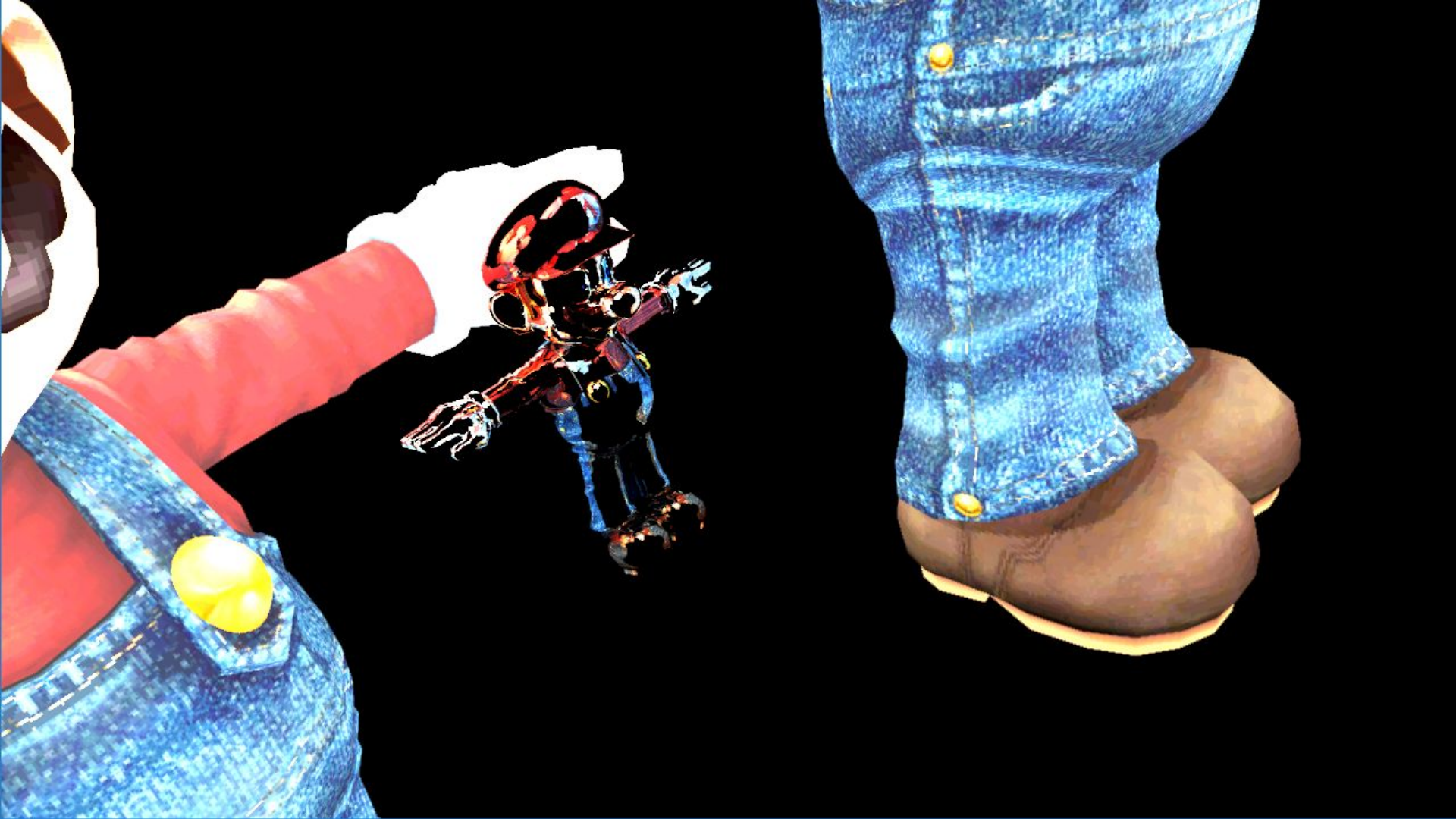
Current Progress

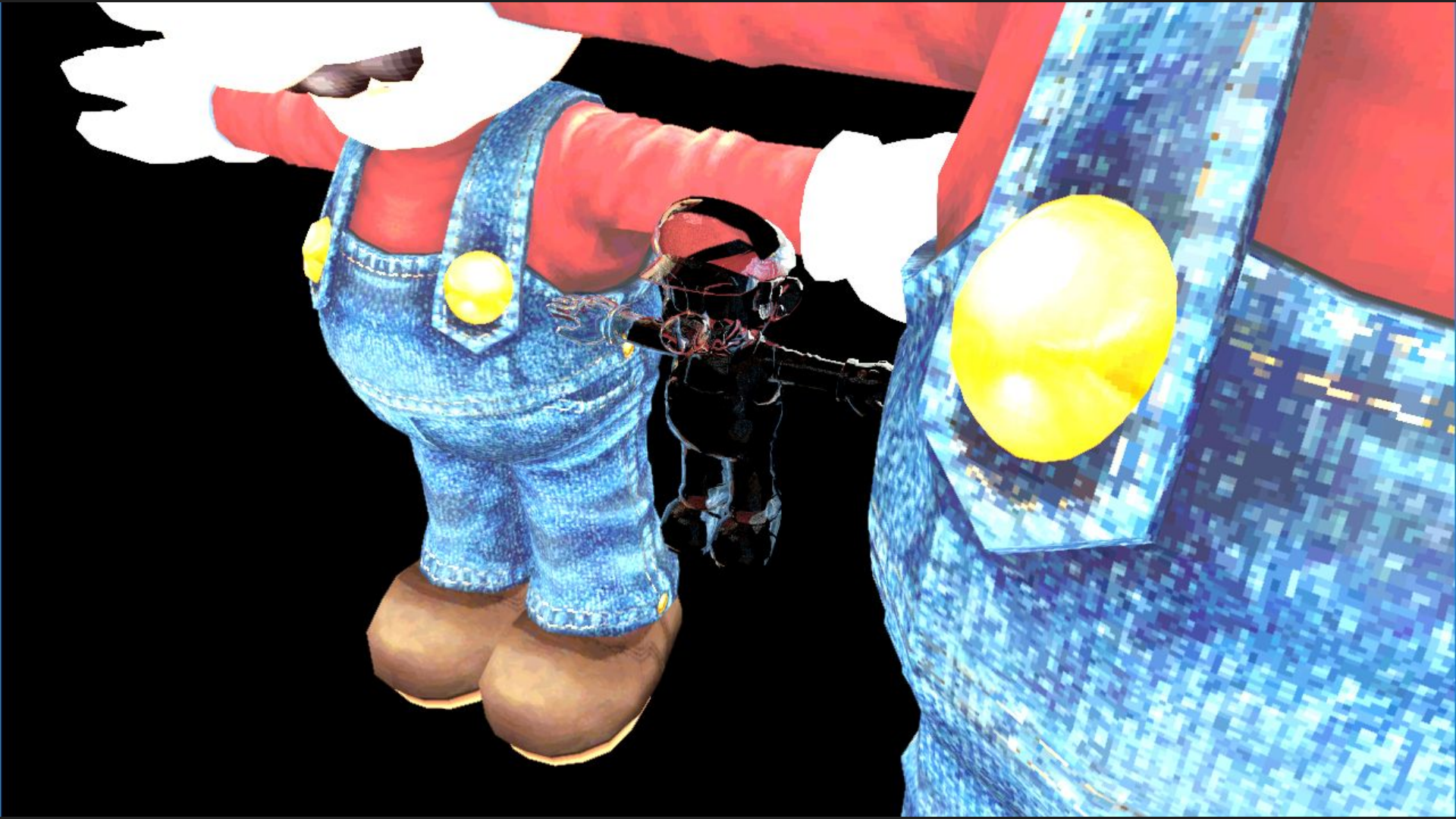
MILESTONE II - Part 1

Path Tracing Pipeline

MILESTONE II - Part 2

Diffuse, Reflective, Refractive, Fresnel, Schlick

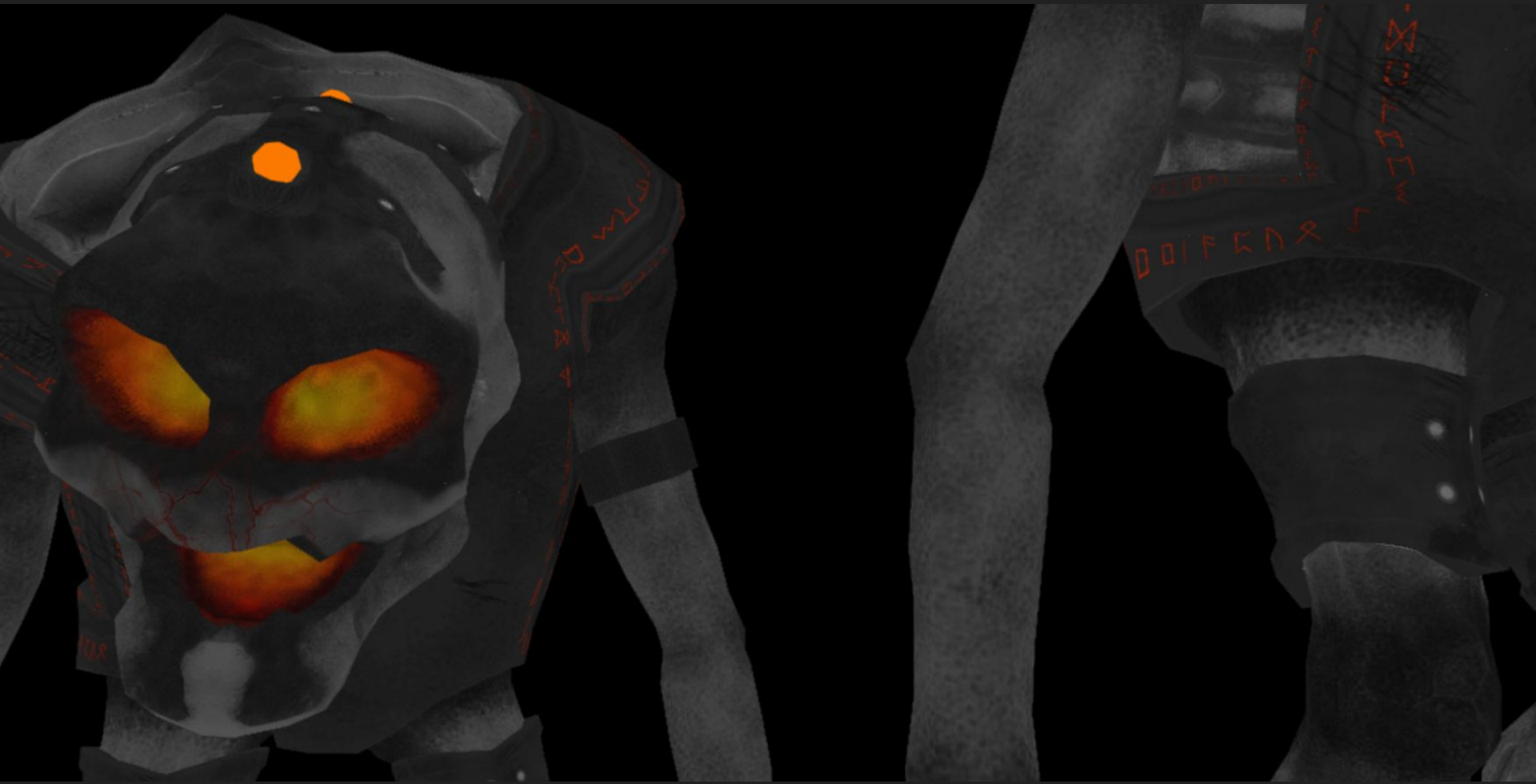




MILESTONE I - Part 3

Scene Loading (multiple objects, multiple materials, multiple textures)

```
MODEL 1
path src/objects/dragon.obj

MODEL 2
path src/objects/wahoo.obj

MODEL 3
path src/objects/aline.obj

MODEL 4
path src/objects/chromie.obj

TEXTURE 1
path src/textures/chromie.jpg

TEXTURE 2
path src/textures/normal.jpg

OBJECT 1
model 1
albedo_tex 1
normal_tex 2
material -1
trans       10 0 0
rotat       0 160 0
scale       2 2 2

OBJECT 2
model 2
albedo_tex 1
normal_tex 2
material -1
trans       0 -1 0
rotat       0 160 0
scale       0.5 0.5 0.5

OBJECT 3
model 3
albedo_tex 1
normal_tex 2
material -1
trans       0 4 0
rotat       0 160 0
scale       1 1 1

OBJECT 3
model 4
albedo_tex 1
normal_tex 2
material -1
trans       0 1 10
rotat       0 90 0
scale       0.4 0.4 0.4
```



```
#define DOF 0

RaytracingAccelerationStructure Scene : register(t0, space0);
RWTexture2D<float4> RenderTarget : register(u0);
ByteAddressBuffer Indices[] : register(t0, space2);
StructuredBuffer<Vertex> Vertices[] : register(t0, space1);
Texture2D text[] : register(t0, space3);
Texture2D norm_text[] : register(t0, space4);
SamplerState s1 : register(s0);
SamplerState s2 : register(s1);
```

```
{
  auto num_models = m_sceneLoaded->modelMap.size();
  auto num_textures = m_sceneLoaded->textureMap.size();

    CD3DX12_DESCRIPTOR_RANGE ranges[5]; // Perfomance TIP: Order from most frequent to least frequent.
    ranges[0].Init(D3D12_DESCRIPTOR_RANGE_TYPE_UAV, 1, 0);  // 1 output texture at u0
    ranges[1].Init(D3D12_DESCRIPTOR_RANGE_TYPE_SRV, num_models, 0, 1);  // 2 static index and vertex buffers and texture at t1 and t2
    ranges[2].Init(D3D12_DESCRIPTOR_RANGE_TYPE_SRV, num_models, 0, 2);  // 2 static index and vertex buffers and texture at t1 and t2
    ranges[3].Init(D3D12_DESCRIPTOR_RANGE_TYPE_SRV, num_textures, 0, 3);  // 1 static texture buffer at t3 // LOOKAT
    ranges[4].Init(D3D12_DESCRIPTOR_RANGE_TYPE_SRV, num_textures, 0, 4);  // 1 static normal texture buffer at t4

    CD3DX12_ROOT_PARAMETER rootParameters[GlobalRootSignatureParams::Count];
    rootParameters[GlobalRootSignatureParams::AccelerationStructureSlot].InitAsShaderResourceView(0);
    rootParameters[GlobalRootSignatureParams::SceneConstantSlot].InitAsConstantBufferView(0);
    rootParameters[GlobalRootSignatureParams::OutputViewSlot].InitAsDescriptorTable(1, &ranges[0]);
    rootParameters[GlobalRootSignatureParams::VertexBuffersSlot].InitAsDescriptorTable(1, &ranges[1]);
    rootParameters[GlobalRootSignatureParams::IndexBuffersSlot].InitAsDescriptorTable(1, &ranges[2]);
    rootParameters[GlobalRootSignatureParams::TextureSlot].InitAsDescriptorTable(1, &ranges[3]); //LOOKAT
    rootParameters[GlobalRootSignatureParams::NormalTextureSlot].InitAsDescriptorTable(1, &ranges[4]);
```

Upcoming Goals

MILESTONE III

Fresnel & Schlick (done)

Dispersion

Subsurface scattering

Finish scene loading

Another application of raytracing (?)