

# FORMS OF VISUALIZATION

MATERIALS, SHADER GRAPH, VFX

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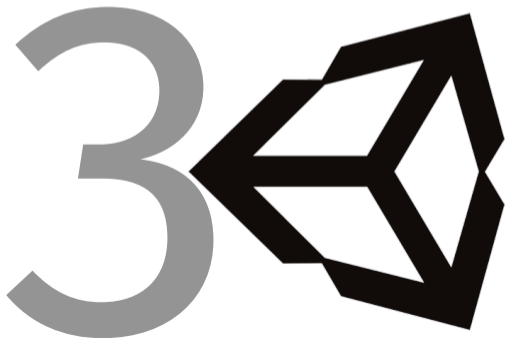
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DCGM, [CPhoto@FIT](mailto:CPhoto@FIT)

FACULTY OF FINE ARTS

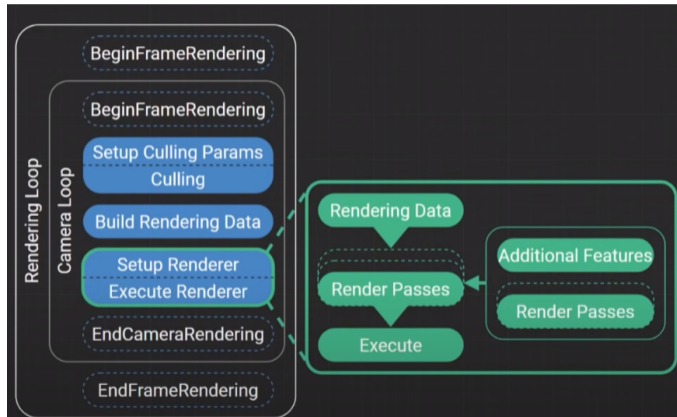
GAME MEDIA STUDIO



# UNITY RENDERING PIPELINE

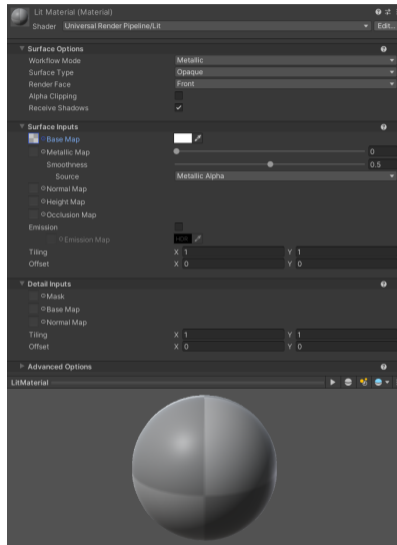
- Standard → Black Box
- Scriptable Render Pipeline
- Pre-Built: URP & HDRP

→ Demonstration



- Lighting Model
- Unlit Shader
- Lit Shader:
  - ▶ Metallic Workflow
  - ▶ Specular Workflow
- Material 2D × 3D

→ Demonstration



# SHADERS AND SHADER GRAPH

- Shader Programs
  - ▶ ShaderLab
  - ▶ HLSL & GLSL
- Shader Pipeline
- Shader Graph
  - ▶ Node Programming
  - ▶ Properties
  - ▶ Live Preview

→ Demonstration

```
#pragma vertex vert
#pragma fragment frag

struct Attributes
{
    float4 positionOS : POSITION;
    float2 uv : TEXCOORD0;
};

struct Varyings
{
    float4 positionHCS : SV_POSITION;
    float2 uv : TEXCOORD0;
};

Varyings vert(Attributes IN)
{
    Varyings OUT;
    OUT.positionHCS = TransformObjectToHClip(IN.positionOS.xyz);
    OUT.uv = TRANSFORM_TEX(IN.uv, _BaseMap);
    return OUT;
}

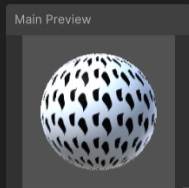
half4 frag(Varyings IN) : SV_Target
{
    half4 color = SAMPLE_TEXTURE2D(_BaseMap, sampler_BaseMap, IN.uv);
    return color;
}
```

# SHADER GRAPH

LitShaderGraph

Shader Graphs +

- Tiling Vector2
- Offset Vector2



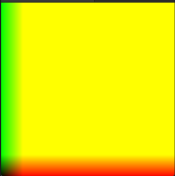
Vertex

- Object Space Position(3)
- Object Space Normal(3)
- Object Space Tangent(3)

Tiling And Offset

UV0

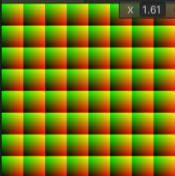
- Tiling(2)
- Offset(2)



Fraction

In(2)

Out(2) X 1.61

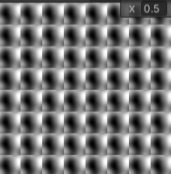


Gradient Noise

UV(2)

Scale(1)

Out(1) X 0.5




Rectangle

UV(2)

Width(1)

Height(1)

Fastest



Fragment

- Base Color(3)
- Tangent Space Normal (Tangent Space)(3)
- X 0 Metallic(1)
- X 0.5 Smoothness(1)
- HDR Emission(3)
- X 1 Ambient Occlusion(1)

# VISUAL EFFECTS

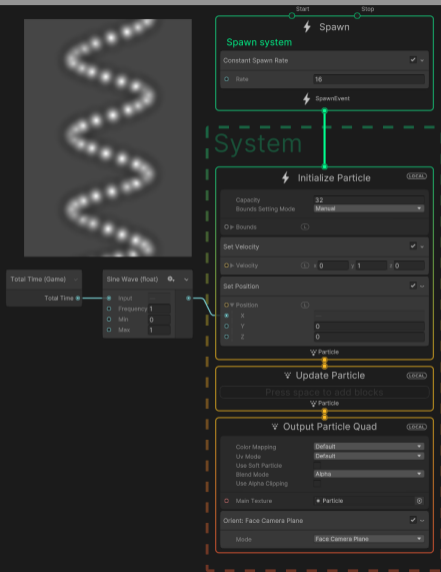
## ■ Particle System

- ▶ Standard Renderer
- ▶ Thousands of Particles
- ▶ Physics Interaction
- ▶ CPU Calculation

## ■ Visual Effect Graph

- ▶ URP & HDRP
- ▶ Millions of Particles
- ▶ No Physics Interaction
- ▶ Compute GPU → no WebGL

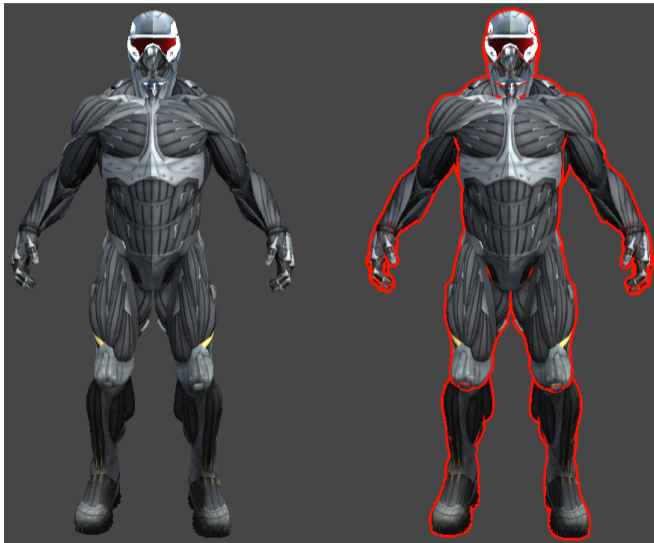
→ Demonstration



# POST PROCESSING

- SRP → Post-Process Volumes
- Shaders & Custom Passes
- Screen-Space Effects
  - ▶ Field of View Blur
  - ▶ Ambient Occlusion
  - ▶ Grain & Scanline
- World-Space Effects
  - ▶ Outlines
  - ▶ Water Caustics

→ Demonstration



# ADDITIONAL RESOURCES

- [\[GitHub\] Universal Rendering Examples](#)
- [\[GitHub\] Shader Graph Examples](#)
- [\[GitHub\] Visual Effect Graph Examples](#)
- [\[GitHub\] Spaceship: Visual Effects and Materials Demo](#)



Source: Boat Attack



Thanks For  
Your Attention!



Wolfenstein 3D

FLOOR

9

SCORE

222000

LIVES

9



HEALTH

62%

AMMO

84



## REFERENCES I