

CHARACTER RENDERING

- Traditional style of diffusion profile skin shader.
- Spherical Gaussian diffusion profile skin shader URP
- Spherical Gaussian diffusion profile skin shader UE4
- Pre-integrated lut diffusion profile skin shader.
- Dual lobe specular Beckmann and GGX.
- Simulated scattering shadow.
- Back scattering via Ambient-Occlusion within shadow occlusions.
- Specular occlusion via indirect GI.
- Horizontal Fade specular Occlusion.
- Sub surface scattering normal diffusion simulation via Normal Cluster.
- Eyeball refraction simulation via Binormal direction.(Many types) Super optimized than meta human eye shader.
- Eyeball refraction simulation via proxy mesh disc direction. Reduced consumption of texture samplers.
- Light direction toon Outline for more artistic thin.
- Dual mat-cap light lit.
- Detail shadow via ambient occlusion sampler data.
- Colorful variant ambient shadow.
- Stylized eye specular highlight thus independent of view direction.
- Texture array index distribution that does not require an ID texture.
- Physically accurate iridescence light model.
- Physically accurate velvet and silk light model.
- Physically based anisotropic specular hair light model.

ENVIRONMENT RENDERING

- Layer stackable prop object shader.
- Weather shader such as rainy and snowy dynamic change.
- 3layer height blend nature object shader.
- Bi-planar mapping.
- Tri-planar mapping.
- Parallax Pixel depth offset.
- Very thin object support shadow pass through via translucency.
- Artistic sub surface scattering.
- Colorful shadow.
- Per object shadow thread-hold.
- Transparent shadow and color.
- Stochastic anti tiling shader.(Many types)
- Wind-field system for grasses and plants.
- Stylized sky rendering.
- Stylized fog.
- Exponential height fog.
- SH data adjustment tools.(Override)
- Pre-aces tone-mapping integrated URP.
- UE4 aces tone-mapping integrated URP.
- Neutral tone-mapping extend for artist.
- Vista shader integrated for Wide landscape.
- Height map based mesh decal.
- Ocean shader. Gustner wave, SSPR, Planar reflection
- Lake and pool shader.
- Water refraction dispersion.
- Caustic receiver for an object floating on water.

SUBSTANCE MATERIALS

- Each project exclusive material libraries such as realistic and stylized.
- All defined unique color index.

PERFORMANEC OPTIMIZATION

- Shader performance analysis of all scenes, characters, and effects. Optimized by analyzing GPU IPC occupancy using a decompiled assembly code and modifying equations or functions.
- Optimize all Draw-call for Open World scenes. Analyze the scene and optimize all asset data beyond the production norm.
 - For example, the increase in the call cost of a static object is handled so that the Lightmap index group is managed on a per-octree basis to maintain a suitable GPU instance.
 - The tree on the terrain is made of a shadow proxy. When rendering shadows, we handled it so that the call cost was not added frequently. This does not require additional VBO. Since it is also managed in octree group units, the pressure of the combined vertex is not so high in View frustum.
- The texture density of the object is managed very robustly. A Texel conformity evaluation script was produced in proportion to the size of the object. My solution did not simply evaluate the Texel density using the mip-map level.
- Overdraw, which occurs when using transparent effects, directly developed Transparent depth pre-pass to avoid increasing the discard cost of special effects that occur frequently.
- The plane reflection where CPU Overhead occurs changes to SSPR and treats only translucent objects or certain objects that are more than 3 meters floating in the air as plane reflections.
- Depending on the size of the object relative to the viewing distance, the casting shadow is automatically turned on or off. Optimize Shadow casting costs at levels not seen as artifact.
- All the textures...For example, the texture resolution of Albedo, Roughness, and AO is determined by the results of the discrimination within the actual game rendering. Optimizes the cost of Pixel sampler and minimizes the possibility of video memory overhead.
- The common texture uses a possible Texture array. It has an advantage in terms of cache hit.