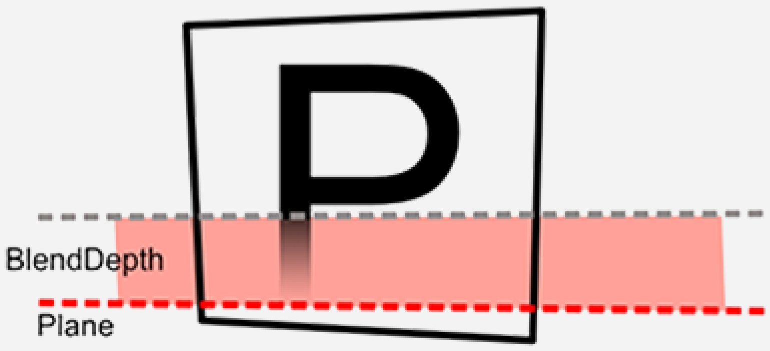
FAST SOFTPARTICLE

VisualWorks

The Fast Softparticle Package might make a soft edge on the particle where the hard-edge occurs. (aka Soft-particles)

KEY IDEA



Detect one of the bottom planes of the particle.
Blend alpha based on distance from the plane.

KEY FEATURES

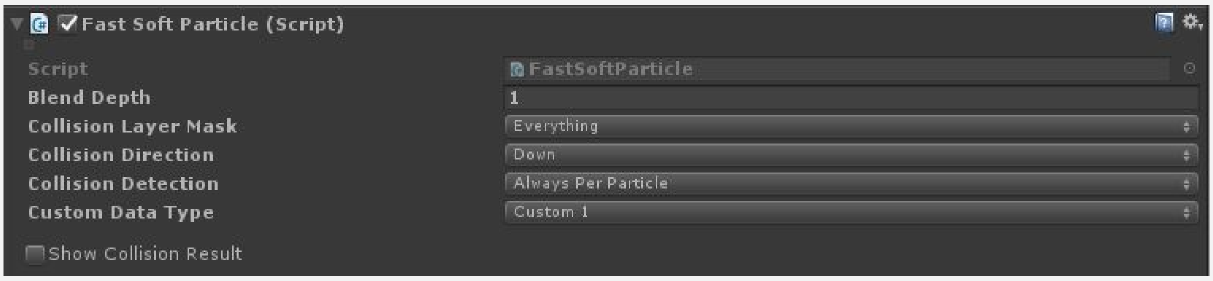
- NO G-buffer is used.
    - Mobile friendly
    - Forward rendering-pipeline friendly
- It uses vertex-streams for blend information per particle.
- Collision detection for blending is computed in a scene.
    - Per Particle-playing
    - Per a particle-system
    - Per Particle
- The changed shader is small and too cheap.

HOW TO USE

1. Import the package

2. Select a particle system that has a hard edge on the ground. It is not necessary to apply to all particle systems.

3. Attach a FastSoftParticle Component.



Fast Soft Particle (Script)

Script	FastSoftParticle
Blend Depth	1
Collision Layer Mask	Everything
Collision Direction	Down
Collision Detection	Always Per Particle
Custom Data Type	Custom 1

Show Collision Result

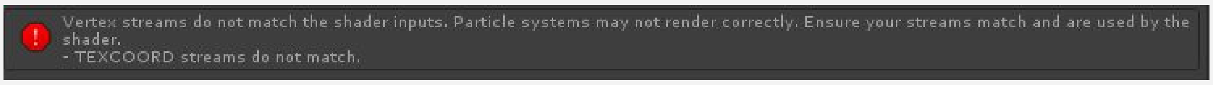
4. Change a shader to a built-in shader in the package. If it is the built-in shader, you can switch by pressing the "Switch Shader to Fast SoftParticle Shader" button.

This package is provided by modifying the shader below. If the shader is your own, please refer to the next section.

Particles/Additive Legacy Shaders/Particles/Additive	Particles/Fast/Additive
Particles/~Additive-Multiply Legacy Shaders/Particles/~Additive-Multiply	Particles/Fast/~Additive-Multiply
Particles/Additive (Soft)	Particles/Fast/Additive (Soft)
Particles/Alpha Blended	Particles/Fast/Alpha Blended
Particles/Anim Alpha Blended	Particles/Fast/Anim Alpha Blended *
Particles/Blend	Particles/Fast/Blend
Particles/Multiply	Particles/Fast/Multiply
Particles/Multiply (Double)	Particles/Fast/Multiply (Double)
Particles/Alpha Blended Premultiply	Particles/Fast/Alpha Blended Premultiply

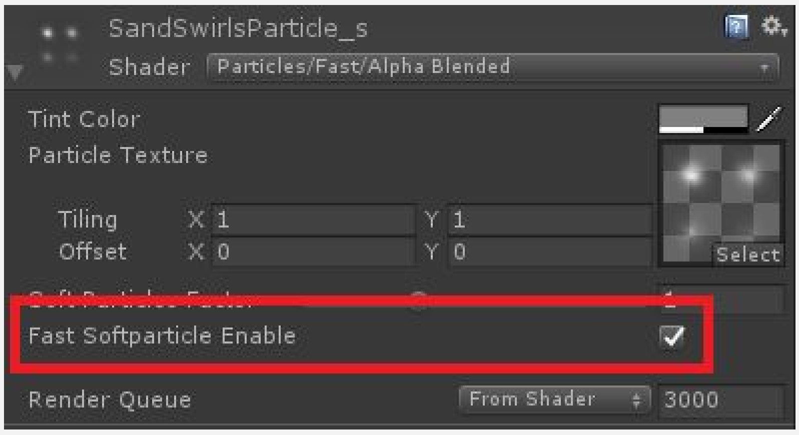
* DataType = Custom2 (Texcoord2)

If this is completed, the below warning disappears.



```
Vertex streams do not match the shader inputs. Particle systems may not render correctly. Ensure your streams match and are used by the shader.
- TEXCOORD streams do not match.
```

Then turn on the Fast Softparticle Enable


SandSwirlsParticle_s
Shader Particles/Fast/Alpha Blended
Tint Color
Particle Texture
Tiling X 1 Y 1
Offset X 0 Y 0
Soft Particles Factor 1
Fast Softparticle Enable ✓
Render Queue From Shader 3000

5. Set options

- Blend Depth : Blending range (world distance)
- Collision Layer Mask
- Collision Direction
- Collision Detection Type
    - Only Once : Detect a common plane only once at the start (Fast, Recommended for flat geometry
    - Always : Detect a common plane every frame
    - Always Per Particle : Detect planes for each particles every frame
- Show Collision Result in editor

MODIFIED BUILT-IN PARTICLE SHADER SAMPLE

```
// Unity built-in shader source. Copyright (c) 2016 Unity Technologies. MIT license (see
license.txt)

Shader "Particles/Fast/Additive" {
Properties {
  _TintColor ("Tint Color", Color) = (0.5,0.5,0.5,0.5)
  _MainTex ("Particle Texture", 2D) = "white" {}
  _InvFade ("Soft Particles Factor", Range(0.01,3.0)) = 1.0
  [Toggle(FASTSOFTPARTICLE_ON)] FASTSOFTPARTICLE_ON("Fast Softparticle Enable", Float) = 0
}

Category {
  Tags { "Queue"="Transparent" "IgnoreProjector"="True" "RenderType"="Transparent"
"PreviewType"="Plane" }
  Blend SrcAlpha One
  ColorMask RGB
  Cull Off Lighting Off ZWrite Off

  SubShader {
    Pass {

      CGPROGRAM
      #pragma vertex vert
      #pragma fragment frag
      #pragma target 2.0
      //#pragma multi_compile_particles
      #pragma multi_compile __ SOFTPARTICLES_ON FASTSOFTPARTICLE_ON
      #pragma multi_compile_fog

      #include "UnityCG.cginc"
      #ifndef UNITY_DECLARE_DEPTH_TEXTURE
      #define UNITY_DECLARE_DEPTH_TEXTURE(A) sampler2D_float A
      #endif

      sampler2D _MainTex;
      fixed4 _TintColor;

      struct appdata_t {
        float4 vertex : POSITION;
        fixed4 color : COLOR;
        float2 texcoord : TEXCOORD0;
        #ifdef FASTSOFTPARTICLE_ON
        float4 plane : TEXCOORD1;
        #endif
        UNITY_VERTEX_INPUT_INSTANCE_ID
      };

      struct v2f {
        float4 vertex : SV_POSITION;
        fixed4 color : COLOR;
        float2 texcoord : TEXCOORD0;
        UNITY_FOG_COORDS(1)
        #ifdef SOFTPARTICLES_ON
        float4 projPos : TEXCOORD2;
        #endif
        #ifdef FASTSOFTPARTICLE_ON
        float depth : TEXCOORD2;
        #endif
        UNITY_VERTEX_OUTPUT_STEREO
      };

      float4 _MainTex_ST;

      v2f vert (appdata_t v)
      {
        v2f o;
        UNITY_SETUP_INSTANCE_ID(v);
        UNITY_INITIALIZE_VERTEX_OUTPUT_STEREO(o);
        o.vertex = UnityObjectToClipPos(v.vertex);
        #ifdef SOFTPARTICLES_ON
        o.projPos = ComputeScreenPos (o.vertex);
        COMPUTE_EYEDEPTH(o.projPos.z);
        #endif
        #ifdef FASTSOFTPARTICLE_ON
        float3 worldPos = mul(unity_ObjectToWorld, v.vertex).xyz;
        o.depth = dot(v.plane, float4(worldPos, 1));
        #endif
        o.color = v.color;
        o.texcoord = TRANSFORM_TEX(v.texcoord,_MainTex);
        UNITY_TRANSFER_FOG(o,o.vertex);
        return o;
      }

      UNITY_DECLARE_DEPTH_TEXTURE(_CameraDepthTexture);
      float _InvFade;

      fixed4 frag (v2f i) : SV_Target
      {
        #ifdef SOFTPARTICLES_ON
        float sceneZ = LinearEyeDepth (SAMPLE_DEPTH_TEXTURE_PROJ(_CameraDepthTexture,
UNITY_PROJ_COORD(i.projPos)));
        float partZ = i.projPos.z;
        float fade = saturate (_InvFade * (sceneZ-partZ));
        i.color.a *= fade;
        #endif
        #ifdef FASTSOFTPARTICLE_ON
        i.color.a *= saturate(i.depth);
        #endif
        fixed4 col = 2.0f * i.color * _TintColor * tex2D(_MainTex, i.texcoord);
        UNITY_APPLY_FOG_COLOR(i.fogCoord, col, fixed4(0,0,0,0)); // fog towards black due
to our blend mode
        return col;
      }
      ENDCG
```

```
    }
  }
}
}
```

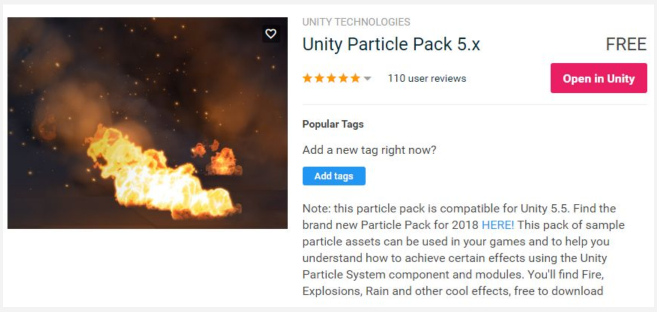
MODIFIED STANDARD PARTICLE SHADERS SAMPLE

```
Shader "Custom/SurfaceShader_VC-S" {
  Properties{
    _Color("Color", Color) = (1,1,1,1)
    _MainTex("Albedo (RGB)", 2D) = "white" {}
    _Normal("Normap Map", 2D) = "bump" {}
    [Toggle(FASTSOFTPARTICLE_ON)] FASTSOFTPARTICLE_ON("Fast Softparticle Enable", Float) = 0
  }
    SubShader{
    Tags{ "Queue" = "Transparent" "RenderType" = "Transparent" }
    LOD 200
    Blend One OneMinusSrcAlpha

    CGPROGRAM
    // Physically based Standard lighting model, and enable shadows on all light types
#pragma surface surf Standard fullforwardshadows vertex:vert alpha:fade
#pragma multi_compile __ FASTSOFTPARTICLE_ON

    // Use shader model 3.0 target, to get nicer looking lighting
#pragma target 3.0

  sampler2D _MainTex;
  sampler2D _Normal;

  struct Input {
    float2 uv_MainTex;
    float4 vertex : SV_POSITION;
    float4 color : COLOR;
#ifdef FASTSOFTPARTICLE_ON
    float depth;
#endif
  };

  void vert(inout appdata_full v, out Input o)
  {
    UNITY_INITIALIZE_OUTPUT(Input, o);
    o.color = v.color;
#ifdef FASTSOFTPARTICLE_ON
    float3 worldPos = mul(unity_ObjectToWorld, v.vertex).xyz;
    o.depth = dot(v.texcoord1, float4(worldPos, 1));
#endif
  }

  fixed4 _Color;

  void surf(Input IN, inout SurfaceOutputStandard o) {
    // Albedo comes from a texture tinted by color
    fixed4 c = tex2D(_MainTex, IN.uv_MainTex) * _Color;
    o.Albedo = c.rgb*IN.color;
    o.Normal = UnpackNormal(tex2D(_Normal, IN.uv_MainTex));
    o.Alpha = c.a*IN.color.a;
#ifdef FASTSOFTPARTICLE_ON
    o.Alpha *= saturate(IN.depth);
#endif
  }
  ENDCG
  }
    FallBack "Diffuse"
}
```

OVERVIEW VIDEO

https://www.youtube.com/watch?v=oWAamVuxpTs

RESOURCES



Note: this particle pack is compatible for Unity 5.5. Find the brand new Particle Pack for 2018 HERE! This pack of sample particle assets can be used in your games and to help you understand how to achieve certain effects using the Unity Particle System component and modules. You'll find Fire, Explosions, Rain and other cool effects, free to download

Unity Particle Pack 5.x by Unity Technologies
https://assetstore.unity.com/packages/essentials/asset-packs/unity-particle-pack-5-x-73777

Thanks for downloading “Fast Softparticle”.

Also, take a look at our other assets.
https://assetstore.unity.com/publishers/40160

If you have any questions, suggestions or feedback, please feel free to contact me at ksi@softnette.com