—— [SwordSlash VFX Asset Documentation]

[Overview] This asset is a Unity script package designed to display trailing visual effects in sync with sword slash animations. It dynamically generates mesh trails that visually emphasize slashing motions, with alpha fading based on movement speed.

This asset consists of the following scripts:

- SwordSlash: The main script for generating and updating the slash trail mesh.
- SlashMeshBuffer: A buffer management class that handles mesh vertices, indices, colors, and UVs.
- SwordSlashController: Controls the start/end transforms and manages effect instantiation.
- SwordSlashControllerEditor: A custom Inspector interface with setup buttons for ease of use.

- [Installation and Setup Instructions] -------

Import the entire asset package into your Unity project.



1. Add the SwordSlashController component to the desired GameObject (character or weapon).

2. Assign a prefab containing the SwordSlash component to the slashEffectPrefab field.



- 3. In the Unity Editor, click the Configure Sword Slash button. This will automatically generate two transforms:
 - SlashStart
 - SlashEnd Adjust their positions as necessary.
- 4. During runtime, call SetSlashActive(true) to display the slash trail, and SetSlashActive(false) to hide it.



SwordSlashController manages the initialization, reconstruction, and visibility of the slash effect.

- Public Field:
 - GameObject slashEffectPrefab: Prefab that includes the SwordSlash component.
- Main Methods:
 - ConfigureSwordSlash():
 - Automatically creates SlashStart and SlashEnd transforms
 - Instantiates slashEffectPrefab and connects it to the controller
 - ResetSwordSlash():
 - Destroys the current SwordSlash instance and re-invokes ConfigureSwordSlash()
 - SetSlashActive(bool active):
 - o Iftrue, calls ShowSlashEffect()
 - If false, calls HideSlashEffect()
- Auto-created Children:
 - SlashStart: Empty Transform used as the starting point of the trail
 - SlashEnd: Empty Transform used as the end point of the trail

[Details: SwordSlash.cs]

SwordSlash is the core component responsible for the appearance, behavior, and generation of the trail.

Public Fields:

- Transform StartTransform / EndTransform: Start and end points of the trail
- Material slashMaterial: Material for the mesh (ZTest can be toggled)
- int maxSlice: Number of trail slices (affects smoothness, e.g., 45)
- float effectDuration: Lifetime of slices (e.g., 0.1 seconds)
- Color slashColor: Color of the trail (alpha controlled dynamically)
- bool isSpeedThreshold: Whether to hide trail when speed is below threshold
- float speedThreshold: Speed threshold (e.g., 15.0)
- float alphaDecreaseRate: Rate of alpha increase/decrease
- float resetDistanceThreshold: Resets slices if position changes exceed this distance
- bool forceDrawOnTop: If true, disables ZTest to always draw on top

Main Behaviors:

- ShowSlashEffect():
 - Initializes mesh, resets alpha, populates vertices, and starts drawing
- HideSlashEffect():
 - Hides the mesh from view
- LateUpdate():
 - Updates alpha based on speed, adds new slices, refreshes mesh
- GetCurrentSpeed():
 - Calculates movement speed between frames

- [Details: SlashMeshBuffer.cs]

SlashMeshBuffer is a mesh buffer class dynamically used by SwordSlash.

Managed Arrays:

- Vector3[] Vertices
- int[] Indices
- Vector2[] UVs
- Color[] Colors
- Key Methods:
 - AllocateMesh(int vertexCount, int indexCount): Allocates mesh memory
 - UpdateMesh(): Updates Unity Mesh with current buffer data
 - Destroy(): Destroys the mesh object

_____ [Details: SwordSlashControllerEditor.cs] _____

Custom editor for SwordSlashController. The Inspector includes the following buttons:

- Configure Sword Slash: Automatically sets up transforms and connects effects
- Reset Sword Slash: Deletes current effect and recreates it
- Slash Active: Toggle to turn the trail effect on or off

_____ [Additional Notes] _____

Use a shader for slashMaterial that supports ZTest switching.

- StartTransform and EndTransform are expected to be updated via animation.
- You can dynamically change the shape of the trail at runtime by moving the transforms.

This concludes the usage instructions and detailed breakdown of each script in the SwordSlash asset. With this asset, you can easily implement dynamic and visually compelling sword slash effects in your game.