Perlin Noise Master Documentation

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1. Introduction

The Perlin Noise Master is a Unity editor extension tool that provides GPU-accelerated Perlin noise generation capabilities. This tool is designed for developers who need to create procedural textures, terrain, or other natural-looking patterns in their Unity projects.

1.1 Features

- Tileable
- GPU-accelerated computation
- Real-time preview
- FBM (Fractal Brownian Motion) support
- Rich parameter adjustment options
- Texture post-processing
- One-click texture saving

1.2 System Requirements

- Unity 2020.3 or higher
- GPU with Compute Shader support

2. Installation

1. Import the package into your Unity project
2. The tool will be automatically installed in your Unity editor
3. No additional setup is required

3. Quick Start Guide

3.1 Basic Usage

1. Open the tool from Unity's menu: `Tools > Perlin Noise Master`
2. Adjust the basic parameters:
   - Set the desired texture size
   - Adjust the seed value
   - Modify the period
3. Click "Save Texture" to save your generated texture

3.2 Advanced Usage

1. Enable FBM for more natural-looking noise
2. Adjust FBM parameters:

- Octaves
- Persistence
- Lacunarity

3. Use post-processing options to modify the output

4. User Interface

4.1 Main Window

The main window is divided into three sections:

- Basic Settings
- FBM Settings
- Output Settings

4.2 Preview Area

- Real-time preview of the generated noise
- Updates automatically when parameters change

5. Parameter Reference

5.1 Basic Settings

Parameter	Description	Range	Default
Size	Texture dimensions	128-1024	512
Seed	Random seed	0-1000	50
Period	Noise period	2^n	256
Offset	Noise offset	Vector2	(0,0)

5.2 FBM Settings

Parameter	Description	Range	Default
Octaves	Number of layers	2-8	4
Persistence	Amplitude multiplier	0.1-1.0	0.5
Lacunarity	Frequency multiplier	2-4	2.0

5.3 Output Settings

Parameter	Description	Range	Default
Power	Power adjustment	0.1-10.0	1.0
Scale	Scale factor	0.1-10.0	1.0
Offset	Output offset	-1.0-1.0	0.0

6. Script Reference

6.1 NoiseParameters Class

```csharp
public class NoiseParameters
{
    // Basic parameters
    public int width = 512;
    public int height = 512;
    public int seed = 50;
    public int periodX = 256;
    public int periodY = 256;
    public int periodPow = 4;

    // FBM parameters
    public bool enableFBM = false;
    public int octaves = 4;
    public float persistence = 0.5f;
    public float lacunarity = 2.0f;
    public Vector2 offset = Vector2.zero;
    public float amplitude = 1.0f;

    // Output parameters
    public bool modifyOutput = false;
    public float modifyPower = 1.0f;
    public float modifyScale = 1.0f;
    public float modifyOffset = 0.0f;
    public bool invert = false;
}
```

6.2 GPUPerlinNoiseCommand Class

```csharp
public static class GPUPerlinNoiseCommand
{
    public static Texture2D Execute(
        int width, int height,
        int periodX, int periodY,
        int seed,
        int octaves = 1,
        float persistence = 0.5f,
        float lacunarity = 2.0f,
        Vector2? offset = null,
        float amplitude = 1.0f
    );
}
```

6.3 ModifyTextureCommand Class

```csharp
public static class ModifyTextureCommand
{
    public static Texture2D Execute(
        Texture2D inputTexture,
        bool needModity,
        float power,
```

```
        float scale,
        float offset,
        bool invert
    );
}
```

7. Troubleshooting

7.1 Common Issues

1. **Black Preview**

    - Check if your GPU supports Compute Shaders
    - Verify Unity version compatibility

2. **Slow Performance**

    - Reduce texture size
    - Decrease number of octaves
    - Disable FBM if not needed

3. **Texture Not Saving**

    - Check write permissions in target folder
    - Verify texture size is within limits

7.2 Performance Tips

- Use smaller texture sizes for real-time applications
- Adjust octaves based on your needs
- Consider using post-processing for final adjustments

7.3 Support

For additional support:

- Check the Unity Asset Store page
- Contact: 568682445@qq.com