

# Unity Simple Object Pooler

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## Abstract

This report presents the Unity Simple Object Pooler, an optimized pooling system designed to manage objects efficiently within Unity applications. The system supports diverse object types, including particle systems and audio, and includes features like automatic enabling on instantiation, reset on despawn, and dynamic pool resizing. The Unity Simple Object Pooler offers a versatile tool for managing game assets and resources to improve performance and reduce memory usage.

## 1 Introduction

Object pooling is a common technique in game development to manage reusable objects, improving memory management and performance. The Unity Simple Object Pooler by Silent0Wings provides a streamlined approach to object pooling, catering to the needs of Unity developers by enabling efficient object reuse, especially for dynamic elements like projectiles, particle systems, or audio sources.

## 2 Features of the Simple Object Pooler

The Simple Object Pooler offers several features designed to enhance flexibility and control over pooled objects:

- **Multiple Object Types:** Supports various objects like particle systems, audio sources, and other GameObjects.
- **Play On Enable/Instantiate:** Automatically enables or plays objects upon instantiation.
- **Reset On Despawn:** Resets objects to their initial state when returned to the pool.
- **Disable On Despawn:** Disables objects when they are returned to the pool, keeping the hierarchy clean.
- **Dynamic Pool Resizing:** Adjusts the pool size based on demand, preventing both overpopulation and under-utilization of pooled objects.

## 3 Methodology

The Simple Object Pooler is implemented using Unity's GameObject and C# scripting, leveraging Unity's built-in object instantiation and management tools. Each object type is managed through a centralized pool manager that handles requests for spawning, resetting, and despawning objects efficiently.

## 4 Project Structure

The directory structure for this project includes the following:

- **Scenes:** Contains Unity scenes demonstrating the object pooling system in action.
- **Scripts:** Holds the C# scripts implementing the pooling logic and associated behaviors.
- **ScreenShot** (optional): Contains images showcasing the object pooler's features.

## 5 Visualization and Examples

The following images illustrate the Simple Object Pooler's functionality, showing object instantiation, usage, and despawn stages.

### 5.1 Object Pool Initialization

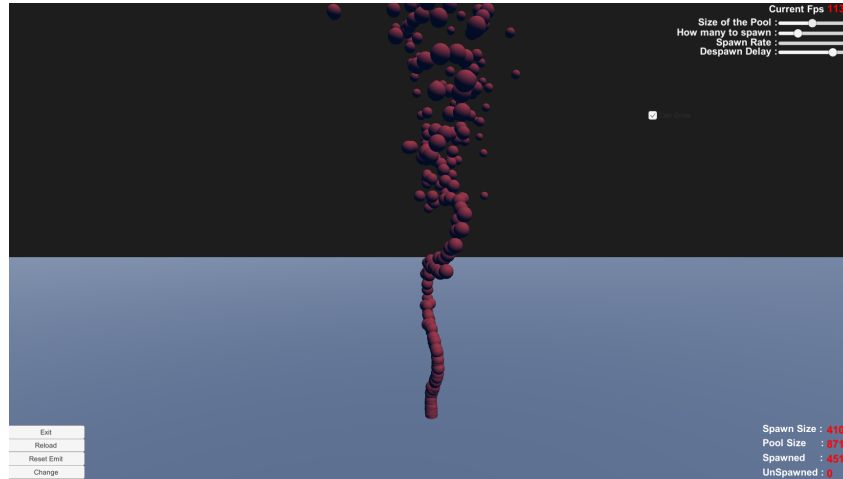


Figure 1: Object Pool Initialization Example

### 5.2 Dynamic Pooling in Action

## 6 Conclusion

The Unity Simple Object Pooler provides an efficient and flexible way to manage reusable objects in Unity, significantly enhancing performance for applications with high instantiation and destruction rates. Future improvements could include custom editor tools for easier pool management and support for more complex object types.