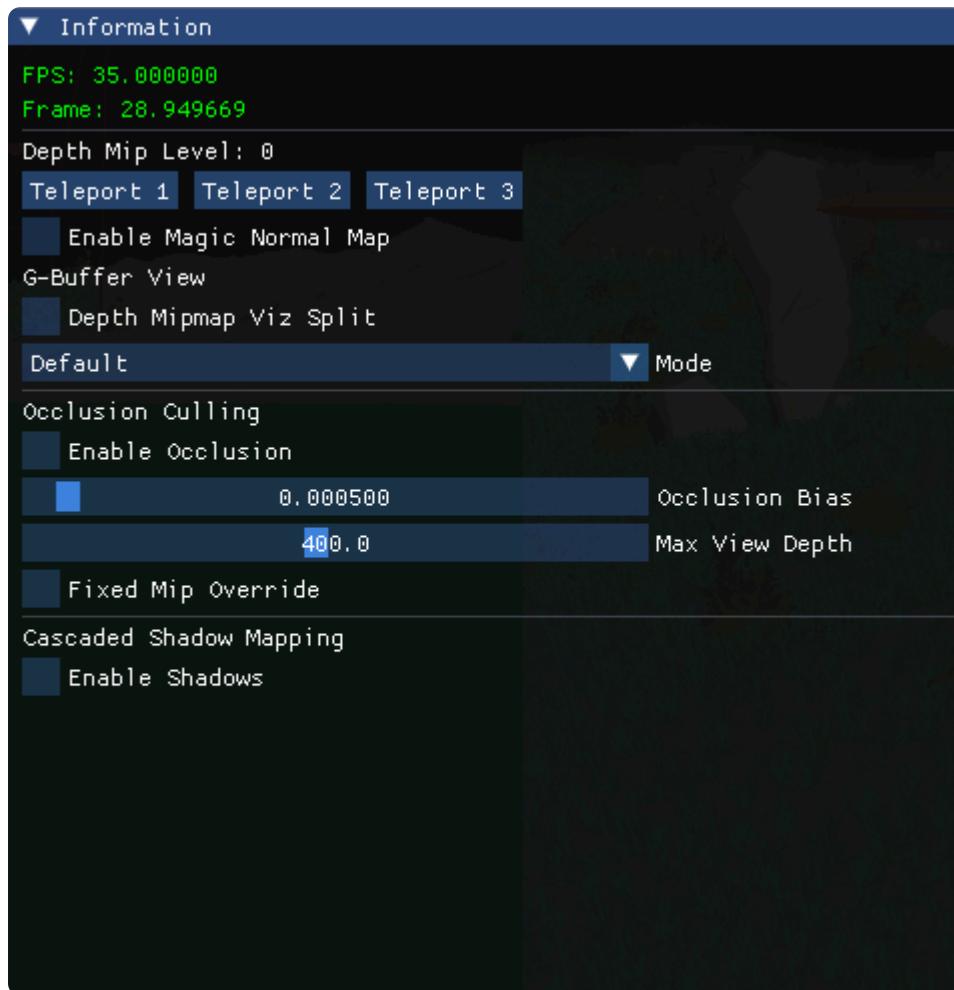


# FINAL Group 10 Outdoor REPORT

## Overview

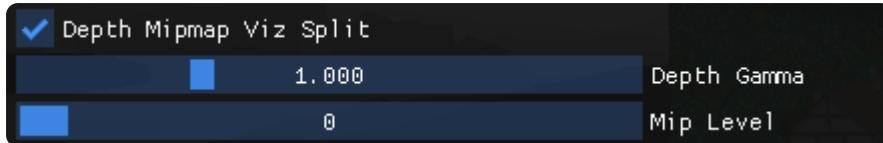
### gui視窗



- Teleport 1/2/3 : 讓玩家相機快速移動到預先定義的三個測試點，方便觀察不同地形與物件分布。
- Enable Magic Normal Map : 啟用後會切換 Magic Stone 的法線貼圖。
- G-buffer View : 提供 G-buffer 中各個 Render Target 的視覺化。
- Depth Mipmap Viz Split : 開啟後，God View 會改為顯示深度金字塔 (Hierarchical Z-Buffer) 各層的 Mipmap，用於觀察 Occlusion Culling 採樣後的深度資訊是否正確。

可以透過 Level 來切換不同解析度的深度貼圖，Depth Gamma 控制則可調整深度可

視化的對比度。



- Occlusion Culling：用來測試視錐裁切後的物件是否被前景遮擋。

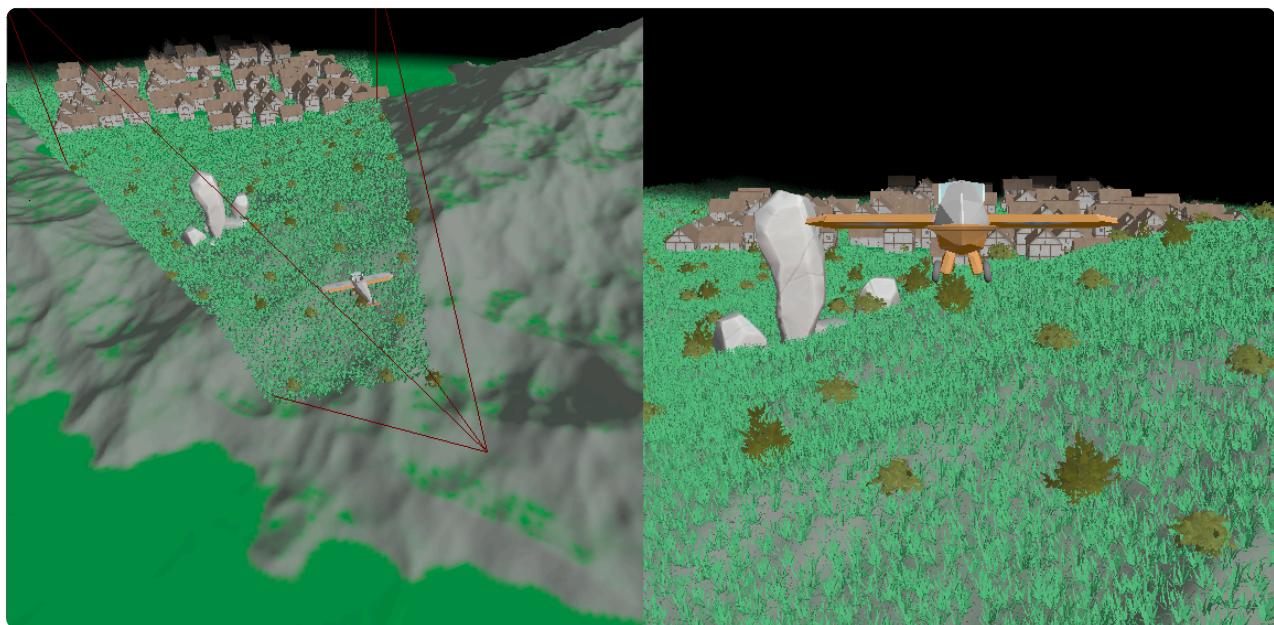
Occlusion Bias：在比較深度時加入容許誤差，避免精度問題造成物件被錯誤裁切。

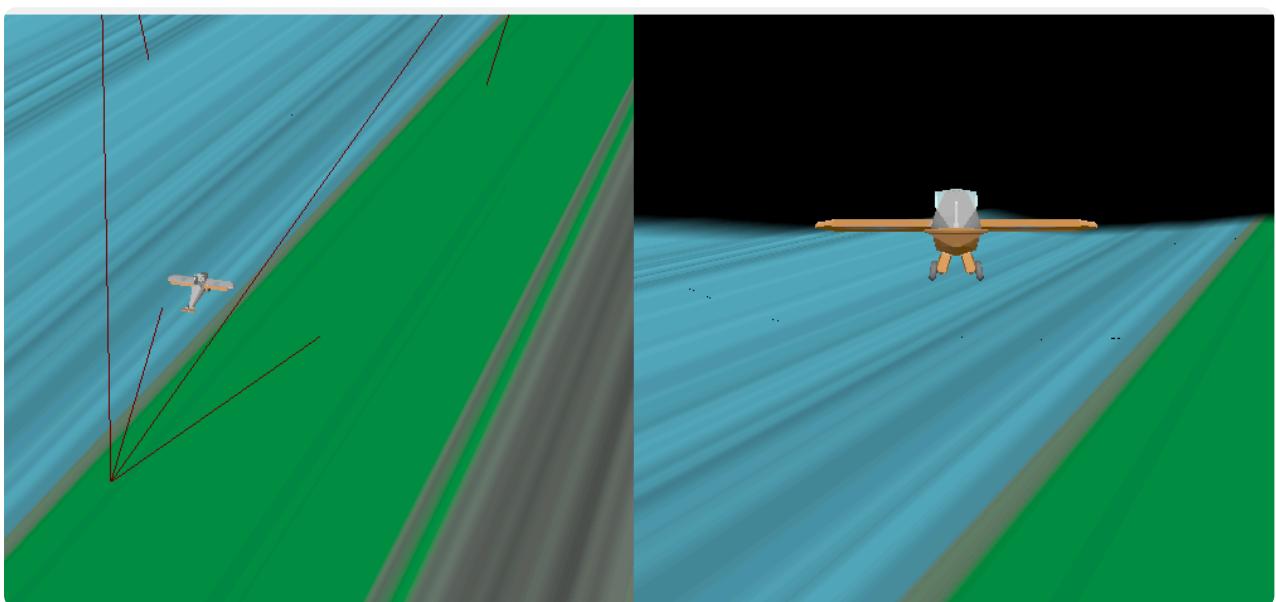
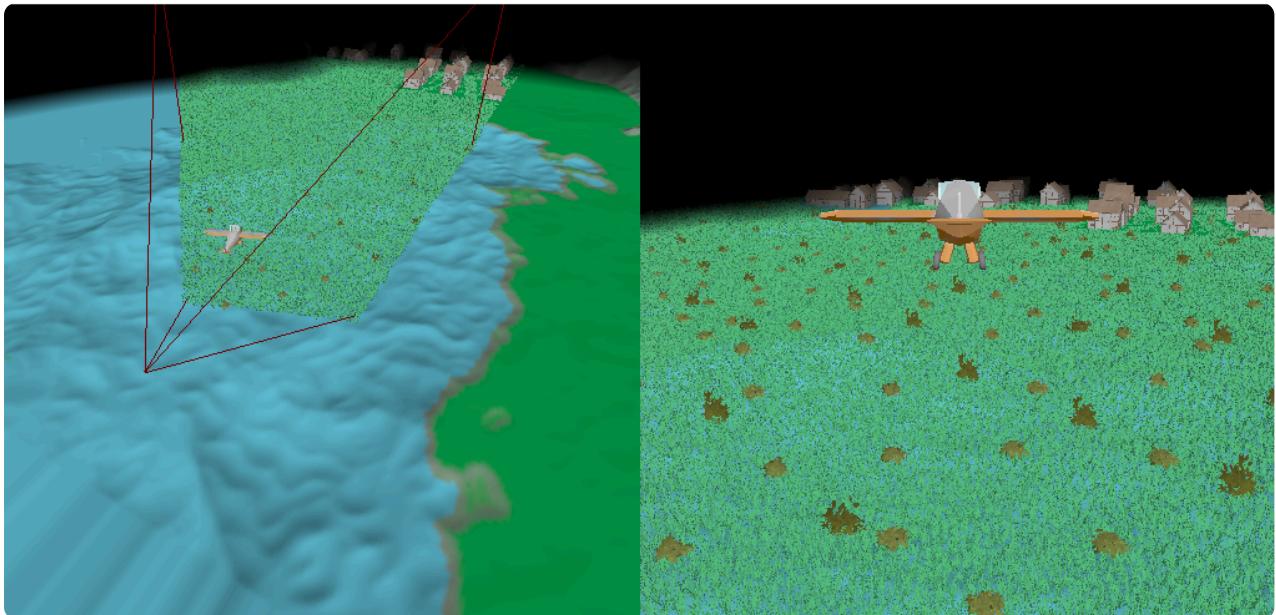
Fixed Mip Override：強制以指定的深度金字塔 Level 做 occlusion。



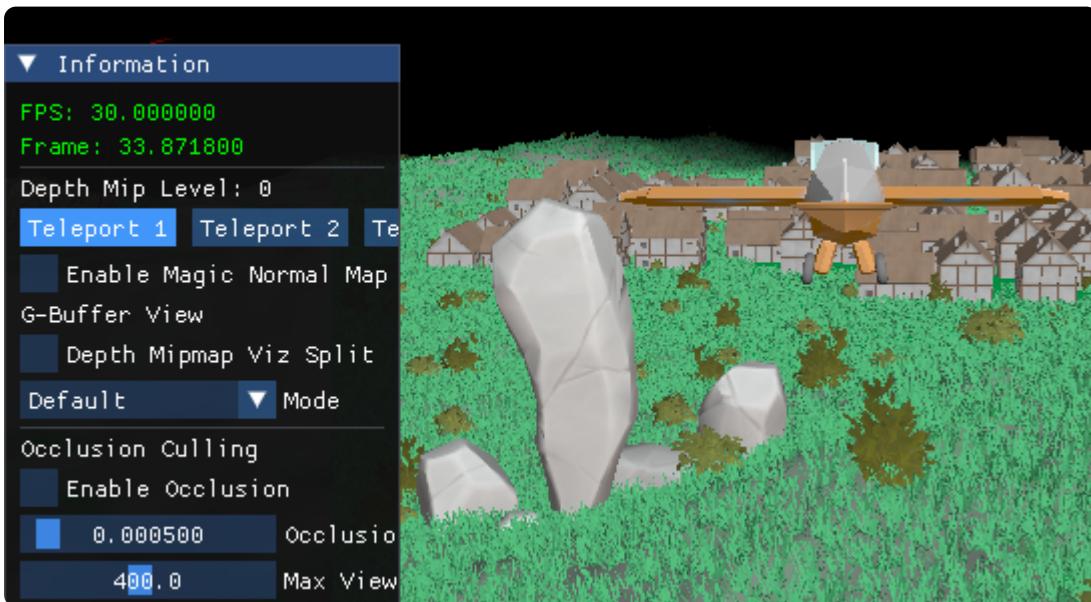
- Enable Shadows：控制是否啟用場景中的陰影貼圖渲染。

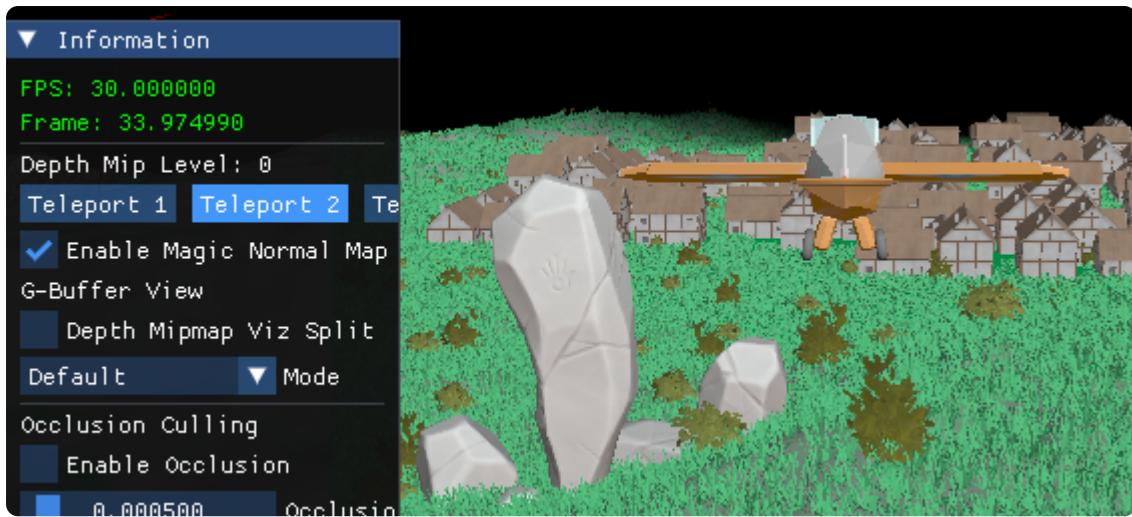
## Phong shading + Basic GPU-driven rendering + Render scene correctly





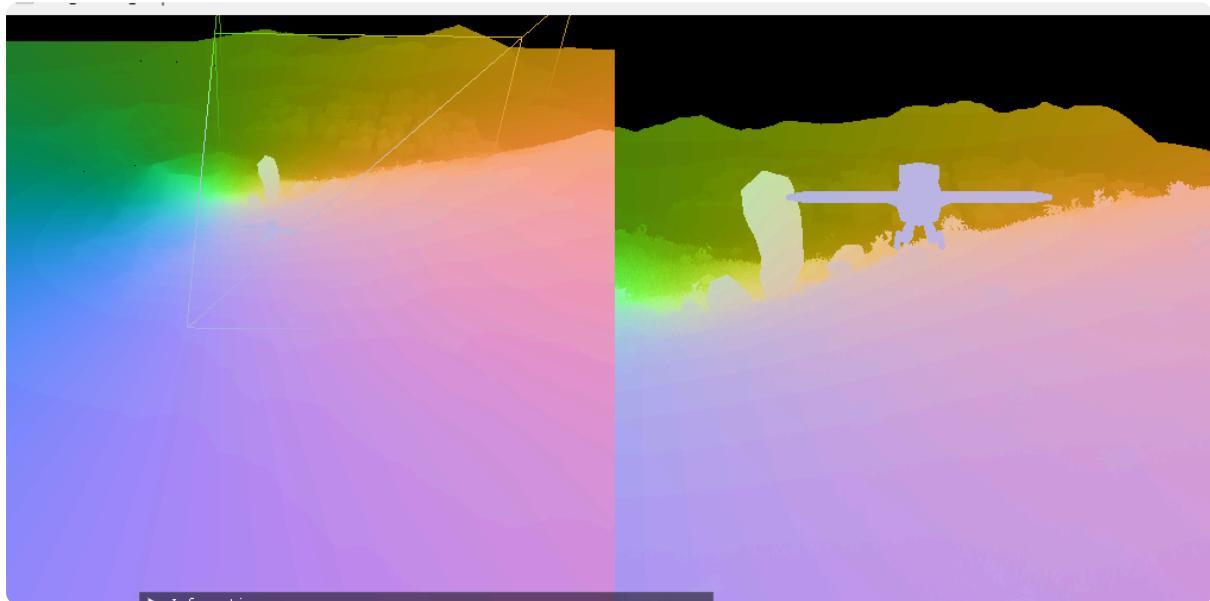
## Normal mapping



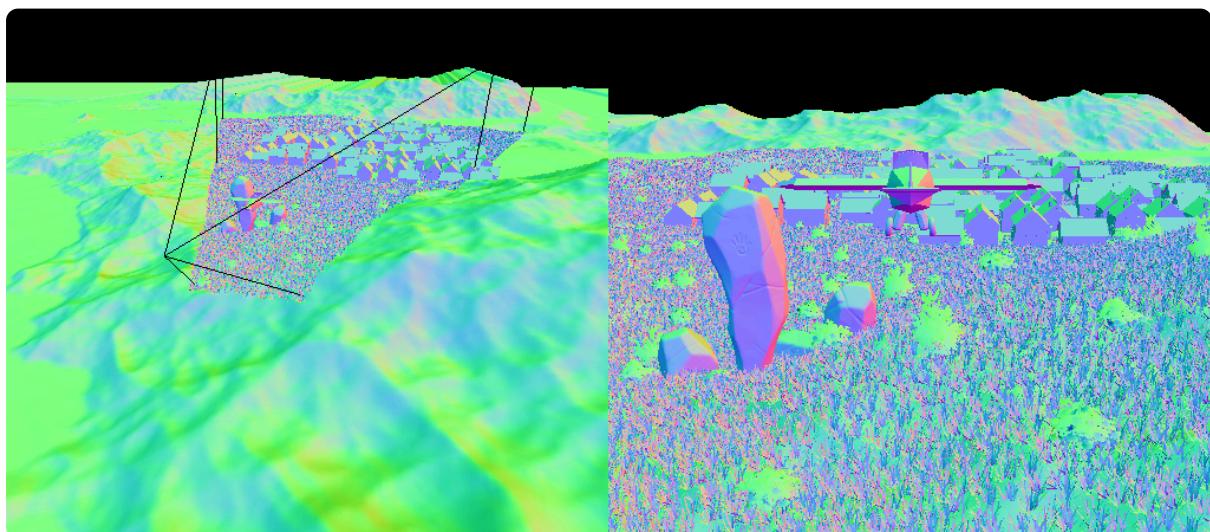


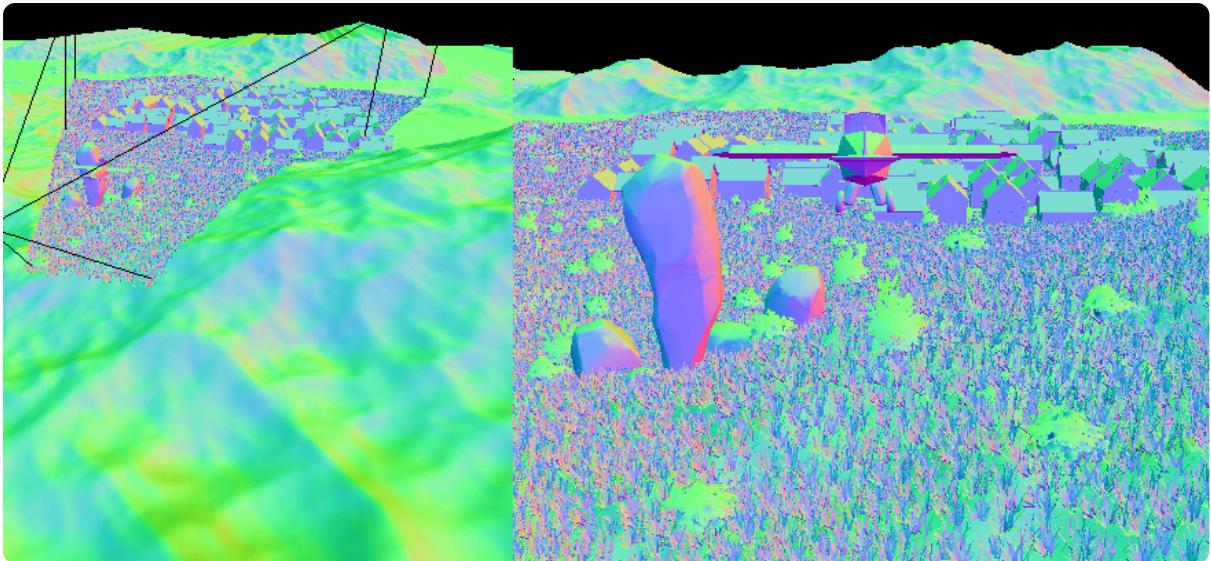
## Deferred shading

- World space vertex

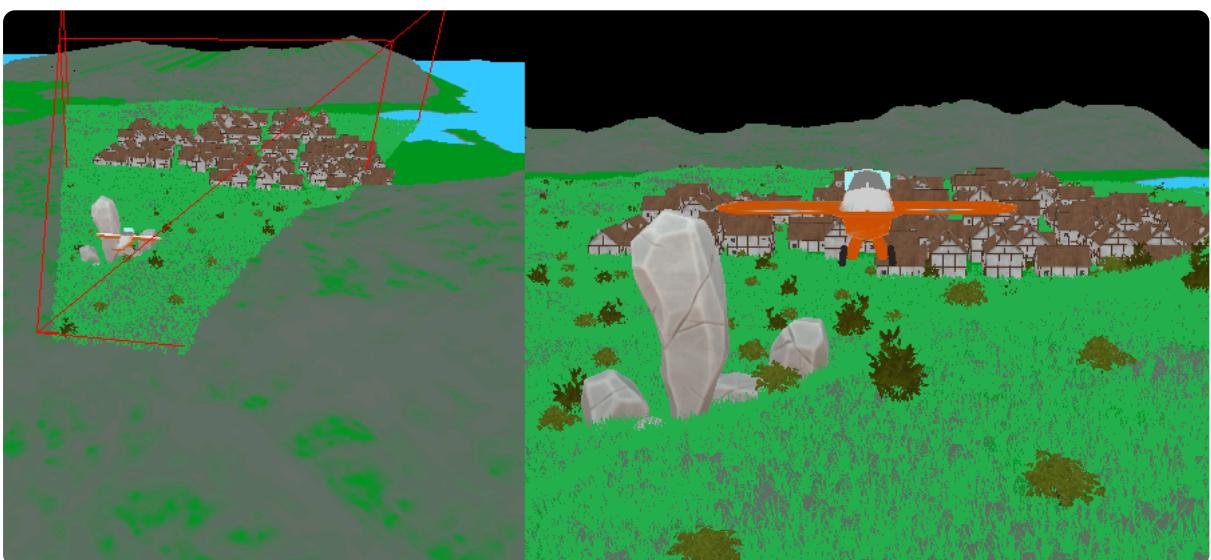


- World space normal





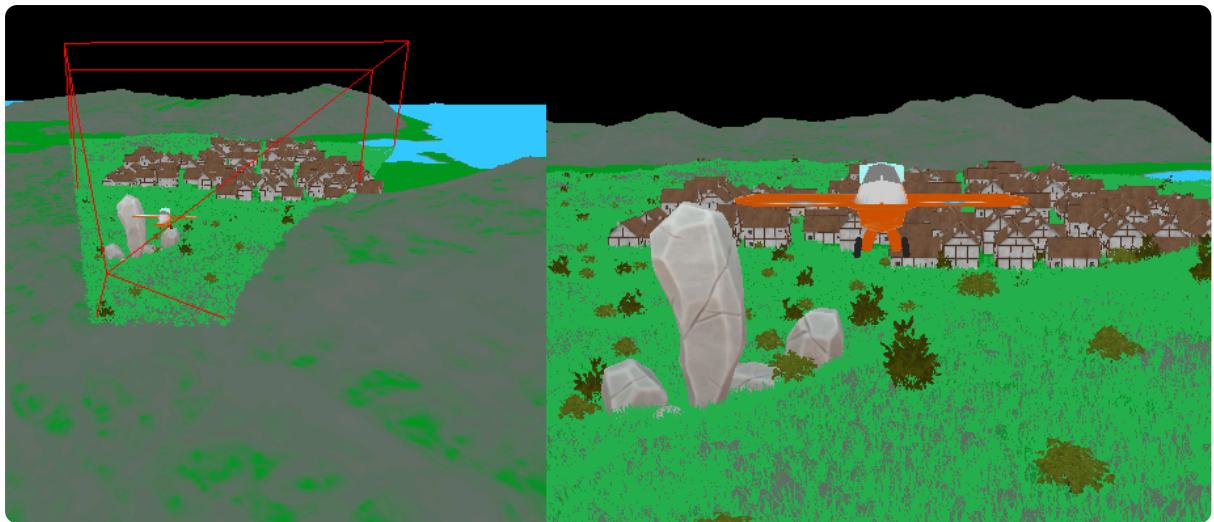
- Diffuse



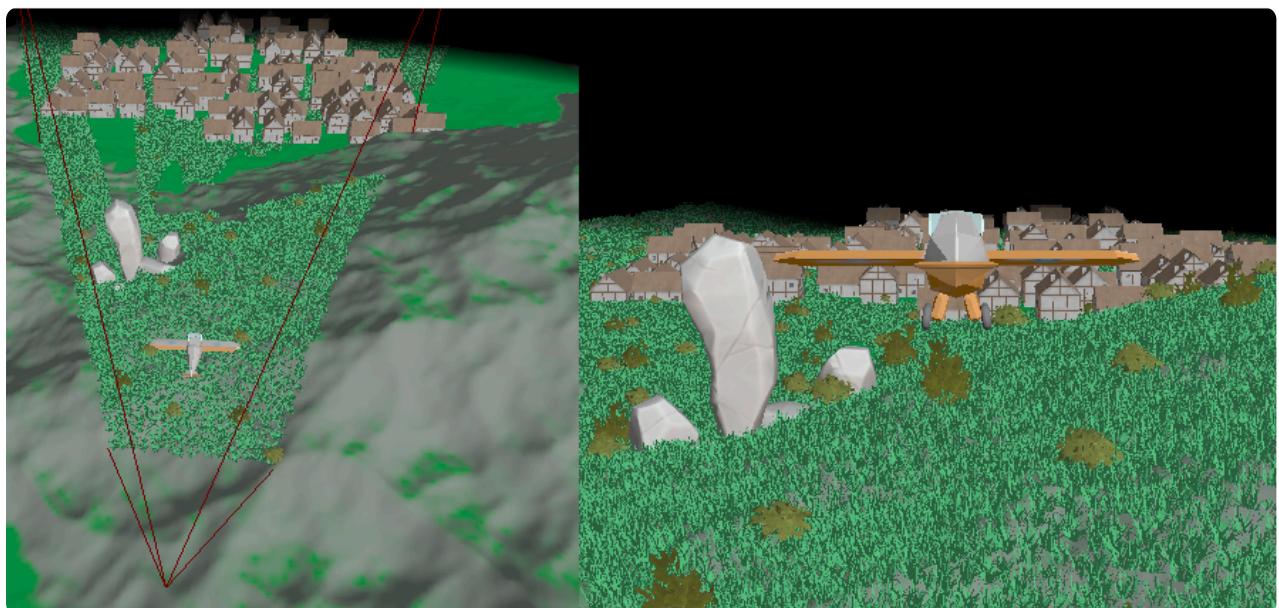
- Specular



- Ambient (equal to diffuse)



## GPU-driven occlusion culling



## GUI

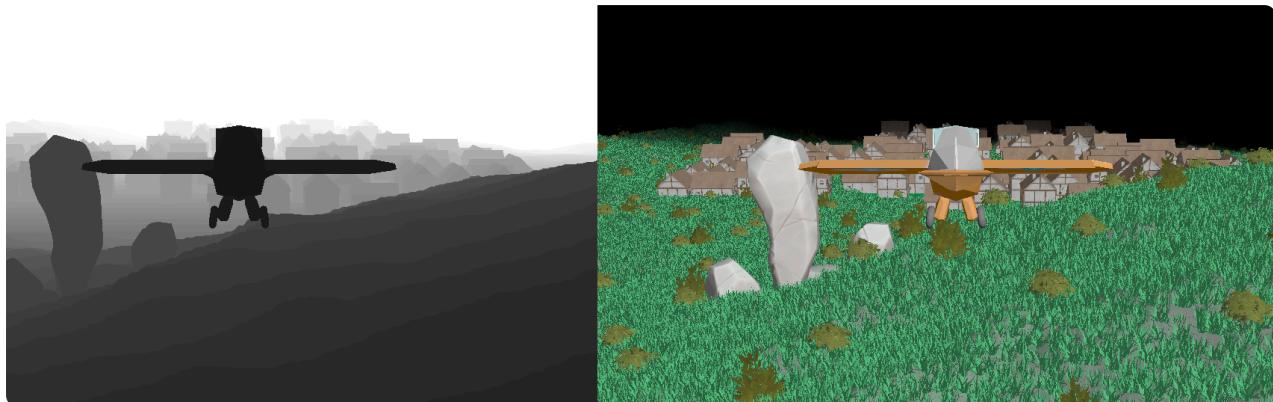


BIAS : 調整遮蔽判斷門檻，越大越容易判定為被遮擋。

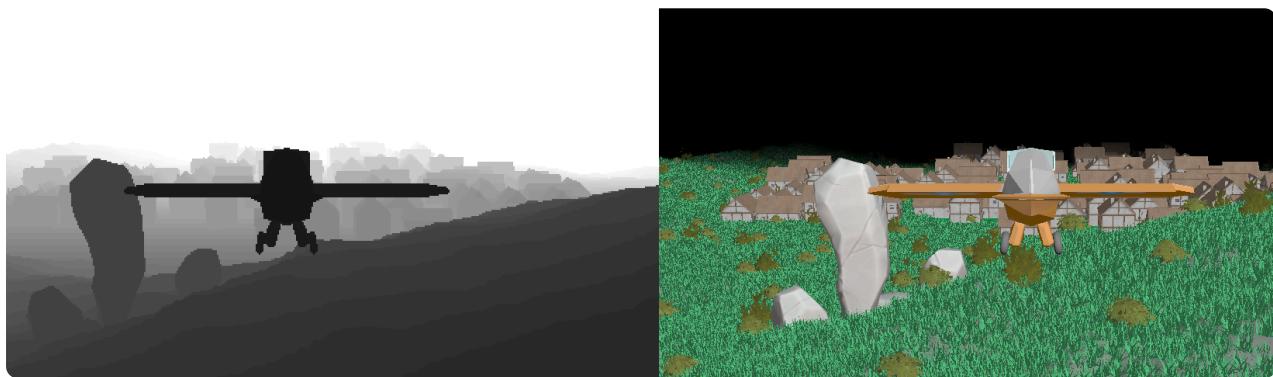
MIP : 控制使用哪一層 Mipmap 進行遮擋判斷，層級越高解析度越低、速度越快。

## 不同LEVEL下的裁切與對應MIPMAP

### LEVEL 0



### LEVEL 1



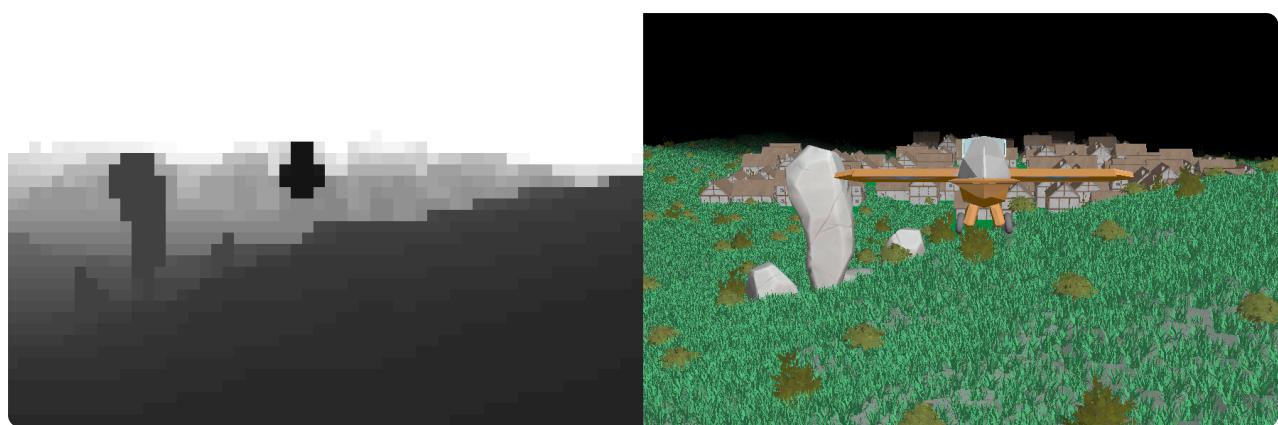
### LEVEL 2



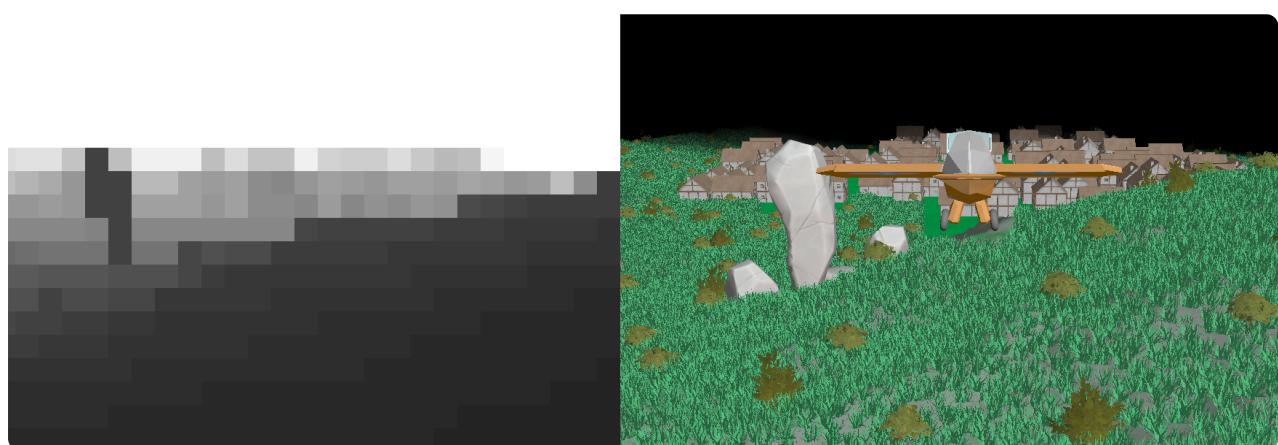
### LEVEL 3



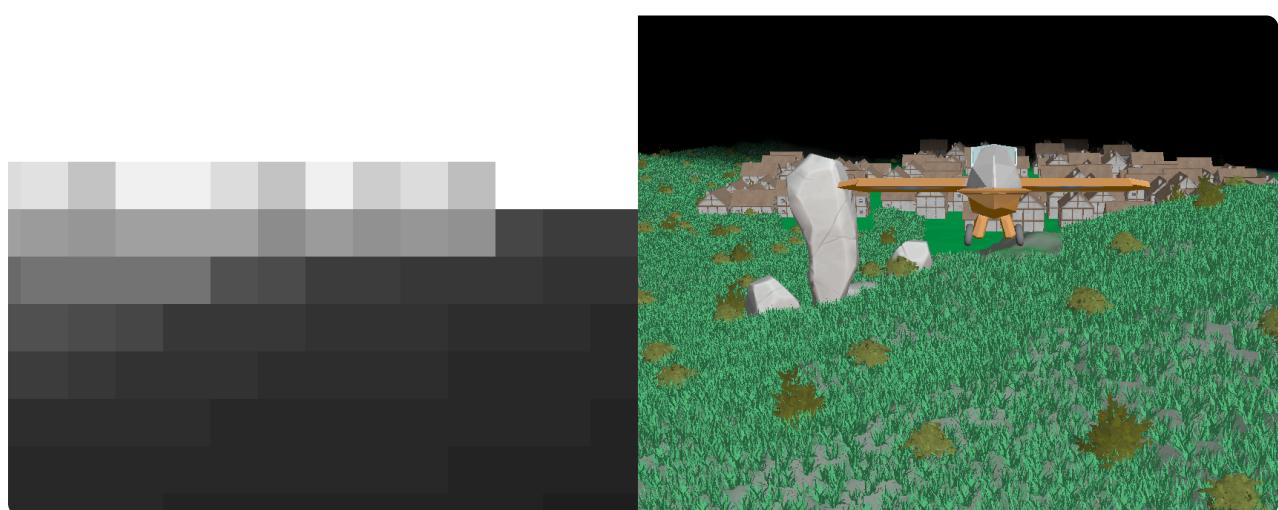
## **LEVEL 4**



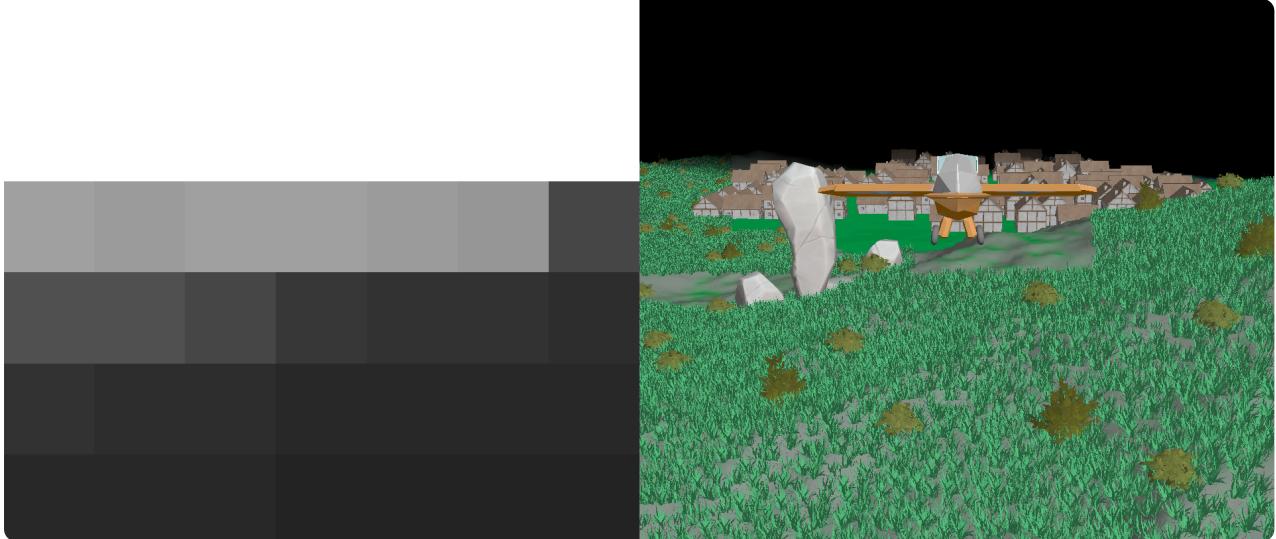
## **LEVEL 5**



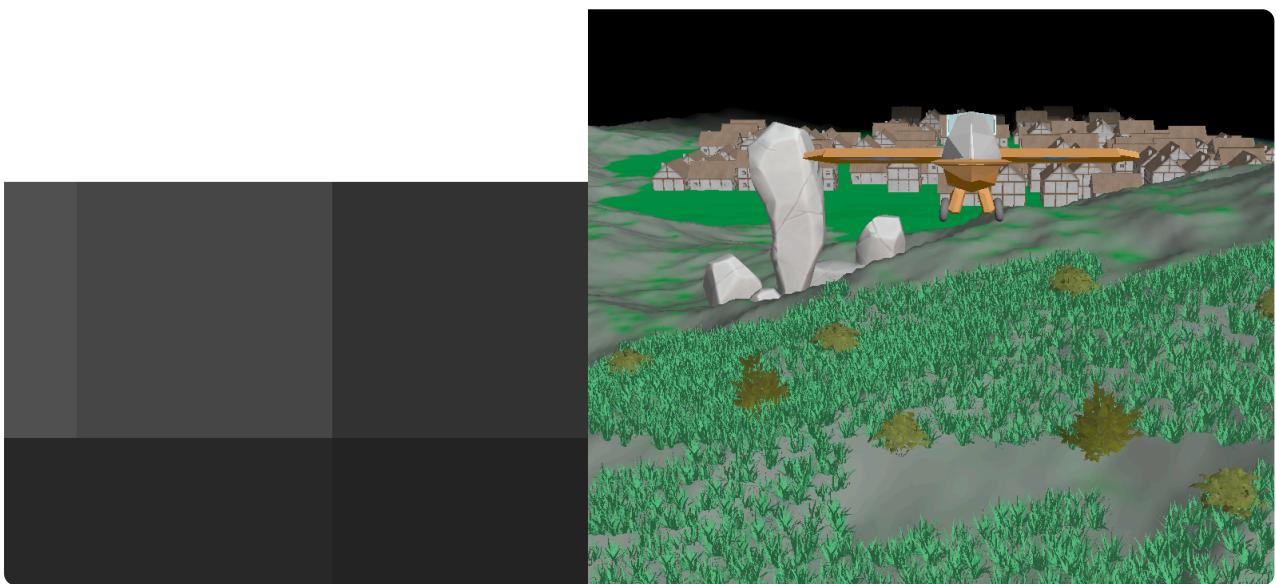
## **LEVEL 6**



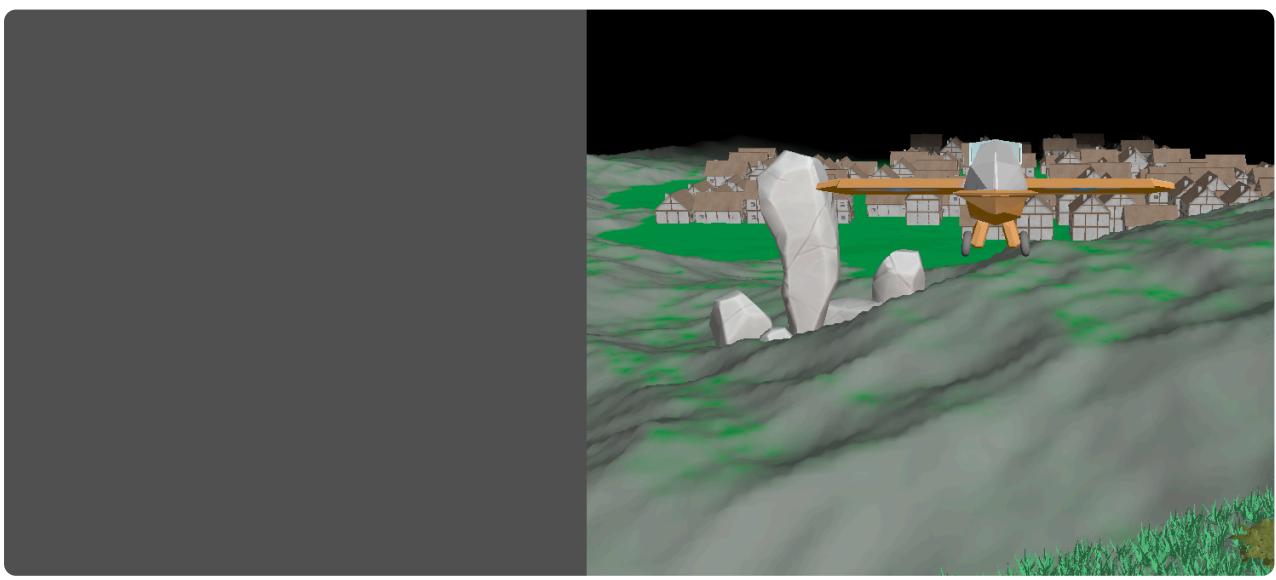
## **LEVEL 7**



**LEVEL 8**



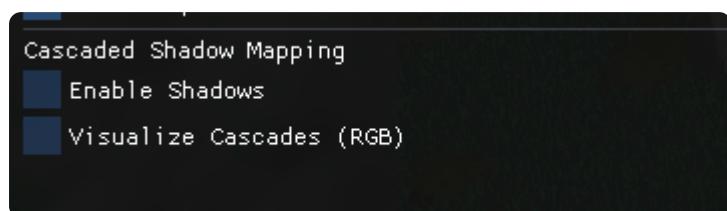
**LEVEL 9**



# Cascade shadow mapping

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## GUI



ENABLE : 啟用或關閉 CSM 陰影。

RGB : 可切換顯示不同 cascade 的陰影範圍或直接觀察 shadow map 深度。

## 表現

