

homework10

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作业要求

- 坦克对战游戏 AI设计 从商店下载游戏：“Kawaii” Tank 或 其他坦克模型，构建 AI 对战坦克。具体要求：
 - 使用“感知-思考-行为”模型，建模 AI 坦克
 - 场景中要放置一些障碍阻挡对手视线
 - 坦克要放置一个矩阵包围盒触发器，保证 AI 坦克能使用射线探测对手方位
 - AI 坦克必须在有目标条件下使用导航，并能绕过障碍。
 - 实现人机对战

作业实现

模型及素材

- 使用的是在Unity Asset Store中找到的tank素材。

Tanks! Tutorial

Unity Technologies Inc.

Version 1.97 - August 12, 2022

asset store

[View in the Asset Store](#) • [Publisher Website](#) • [Publisher Support](#)

Unite Training Day 2015 brings you TANKS!

This 2 player 1 keyboard couch warfest sees you building a complete tank shooter from scratch.

[More...](#)

Images & Videos



[View images & videos on Asset Store](#)

Package Size

Size: 80.31 MB (Number of files: 139)

Supported Unity Versions

2019.4.1 or higher

Purchased Date

December 11, 2022

Release Details

1.97 (Current) - released on August 12, 2022 [More...](#)

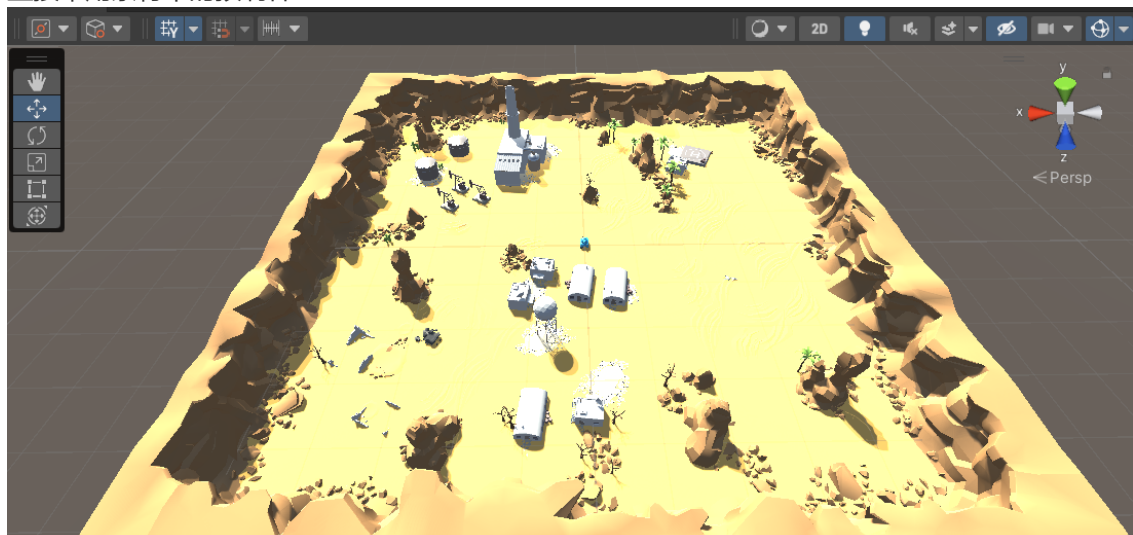
Original - released on September 22, 2015

Assigned Labels

(None)

地图实现

- 直接采用素材中的预制件



玩家控制

- 和作业7中的玩家移动类似,

```
void fixedUpdate () {
    if (!action.isGameOver())
    {
        if (Input.GetKey(KeyCode.W))
        {
            player.GetComponent<Rigidbody>().velocity =
player.transform.forward * 20;
        }
        if (Input.GetKey(KeyCode.S))
        {
            player.GetComponent<Rigidbody>().velocity =
player.transform.forward * -20;
        }
        if (Input.GetKeyDown(KeyCode.Space))
        {
            GameObject bullet = mf.getBullet(tankType.Player);
            bullet.transform.position = new Vector3(player.transform.position.x,
1.5f, player.transform.position.z) + player.transform.forward * 1.5f;
            bullet.transform.forward = player.transform.forward;
            Rigidbody rb = bullet.GetComponent<Rigidbody>();
            rb.AddForce(bullet.transform.forward * 20, ForceMode.Impulse);
        }
        float offsetX = Input.GetAxis("Horizontal");
        action.turn(offsetX);
    }
}
```

工厂模式生成AI坦克

- 工厂模式以单例模式生成, 主要包括创建巡逻坦克的函数。

```
public GameObject getTank()
{
    if(freeTanks.Count == 0)
    {
        GameObject newTank = Instantiate<GameObject>(tank);
        usingTanks.Add(newTank.GetInstanceID(), newTank);
        newTank.transform.position = new Vector3(Random.Range(-100, 100), 0,
Random.Range(-100, 100));
        return newTank;
    }
    foreach (KeyValuePair<int, GameObject> pair in freeTanks)
    {
        pair.Value.SetActive(true);
        freeTanks.Remove(pair.Key);
        usingTanks.Add(pair.Key, pair.Value);
        pair.Value.transform.position = new Vector3(Random.Range(-100, 100),
0, Random.Range(-100, 100));
        return pair.Value;
    }
    return null;
}
```

