Swarmify

Swarmify is a simple swarm, motion planning, and collision avoidance simulation based on a potential field method.

The idea of this project is to provide a basic easy-to-integrate and easy-to-use swarm manipulation toolbox.

How it works

Without going into detail. Every agent (Follower) has its own sensor range. Within that, it reacts to other agents by moving away from them. Also, every agent has a target (Leader) which it tries to reach. In other words. The movement directions results of the sum of all repulsive parts (other agents) and the attractive part (target). Properly set up and tweaked this leads to pretty fluent and also collision-free motion/path planning.

... The terms Leader, Attractor, and Target as well as, Agent, Drone, and Follower are used synonymously.

Basic set up guide

One Leader and one Autonomous drone

1. Import Package
2. Set Layers (30: Droen, 31: Leader) and set Layer Collision Matrix (Drone only by Drone and Leader only by Leader). See images See images "01_AddLayerNames.JPG" and "02_SetMap.JPG"
3. Add scenes to build settings to enable scene switch buttons (Autonomous, AutonomousDirected, and Centralized). See image "03_ScenesInBuild.JPG".

- Now you can start playing around with the test scenes right away.

4. To integrate in you scenes: add **AutonomousDrone** to your scene
5. Add **Leader** to your scene
6. Set **Attractor** of **AutonomousDrone** by dragging **Leader GameObject** in Inspector
7. Hit Play

- Works the same with **AutonomousDroneDirected**
  - only that **AutonomousDroneDirected** rotates its model torwards the **Leader**.

One Leader and multiple Autonomous drones

Just add more **Drones** and assign the same **Leader**
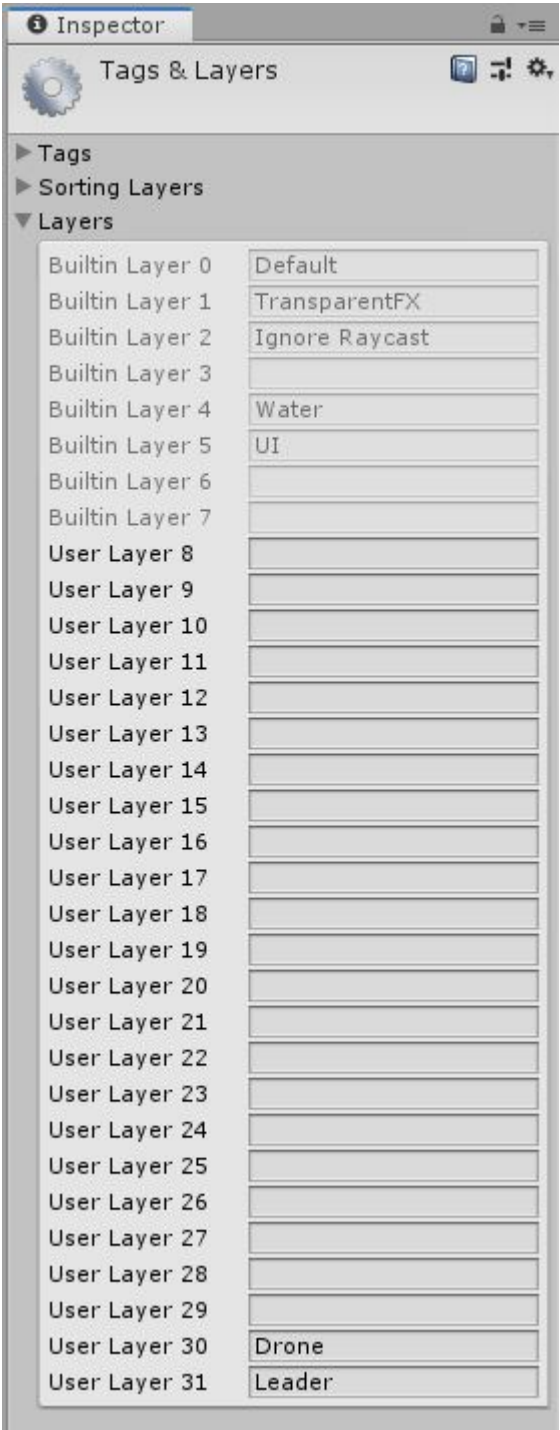
Centralized setup

Same as the Autonomous setup. In addition, add a **CentralizedProcessor** to your scene. Don't forget to assign the **Leader/Attractor** of the **Drone**. As the centralized implementation checks every agent against every agent in each tick, its performance extremely decreases by increasing the number of agents. The autonomous implementation is more efficient.

Scene and Layer/Physics setup

Add scenes in Build Settings.
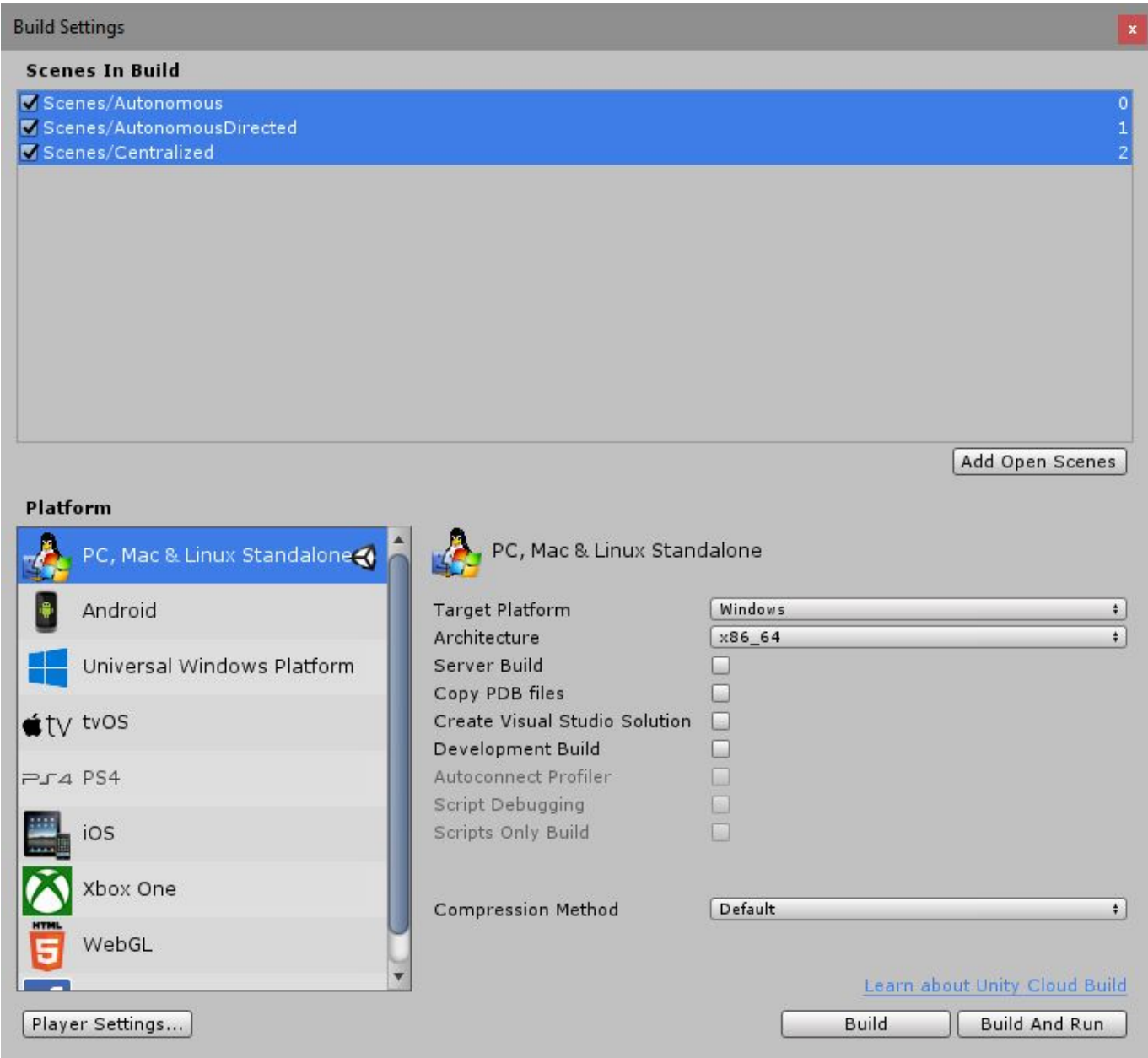
Set Layer Names

Set Layer Collision Matrix