AIE Sydney

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Procedurally Generated City Review

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# Overview

The system can procedurally generate cities at runtime. It can be visually and functionally modified so the user can change the system to suit their needs.

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# Issues Encountered

1. A major issue I was having was with the Delaunay Triangulation Algorithm. This caused numerous issues and was relating the to ClipSite and CalculateDiagram Functions, since there were floating point problems.
2. Building Placement. Trying to Optimally place buildings turned out to be another significant issue. The Optimal: The Polygon containment Problem is classified as a NP- Hard problem, so I will need to go with a much less accurate solution.

# Performance

Performance for the system is manageable, Getting 11-25 fps in the editor and 30-60+ in a build, These depend on whether the city is currently been generated or not. but large cityscapes the performance can drop for 2 reasons.

1. The complex calculations for generating the city is on the main CPU thread, which will cause hiccups in frame rate. This can be solved by moving the system to a different, more recent version of unity where the generation and loading of the city can happen in parallel to the normal game loop.
2. Graphical Performance can be slow depending on the assets your using. This can be fixed numerous ways. Either by reducing the render distance or using better optimised assets with proper lods and culling.

# Additional Changes

1. Performance:Multithreading, Optimising code and assets to get better performance out of the system.
2. More integrated fracture algorithms to have more variation in city layouts.
3. Better building placement to fill holes within blocks.
4. Small filler objects to bring the world alive. Signs, fences, bins, car parks etc