

# Procedural Modelling of Cities implemented as a Blender Plug-In

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## 1 Previous Short Term Objectives

### 1.1 Code Review Week

The script code for this project was to be cleaned up and submitted for comment. It was to conform to accepted programming practises.

### 1.2 Road Intersections

The system was to be fully extended to generate new road segments and intersections wherever two existing roads crossed. In order for this to work correctly, all of the roads have to be generated first and then they should all be cycled through individually and compared to all other road segments. At the point where two roads overlap or cross, a new intersection is to be created and the existing roads are to be changed accordingly.

### 1.3 Region Extraction

A method for region extraction was to be researched which would allow for the simple generation of faces or regions based solely on vertex and edge representations.

## 2 Progress

### 2.1 Code Review Week

The python scripts for this project were cleaned up and commented sufficiently in order to conform to the acceptable programming practises. This code was then updated within the CVS system which this project uses. This ensures both a secondary backup of the code, and also a rollback system whereby any major problems which develop each week can be undone by rolling back to previous versions of the code.

## **2.2 Road Intersections**

The system has been developed to a point where it successfully identifies points of intersection between road segments and an attempt has been made to generate the new intersections and road segments. However due to some flaw in the algorithm this is not resulting in the correct placement of intersections or road segments. Some sample screen shots are provided to show the nature of the problem. Upon review of the screen shots, one possible has arisen. The current system attempts to deal with intersections as each new road segment is created and thus does not take into account the existence of all possible roads, a new implementation must be generated which aims to generate all of the road network and then to take into account intersections.

## **2.3 Region Extraction**

Some research was done on the various methods of region extraction with a focus on finding a method which procedurally generates the faces as the vertices and edges are being generated. However no sufficient solution could be discerned and thus the focus of research may have to resort to more computationally expensive methods which attempt to define faces after the complete mesh has been formed.

## **3 Problems**

The major problem encountered this week was the resolution of the generation of new intersections.

## **4 Objectives for Next Week**

### **4.1 Intersection Resolution**

A final working solution to this problem must be completed

### **4.2 Region Extraction**

A method and initial implementation of a region extraction must be decided upon. This process will be central to both the generation of more complex road networks and of simple building derivation.

### **4.3 Road Layout Testing**

Once the intersection resolution task has been cleared up, further testing must be carried out to determine the best road generation logic to ensure cities which accurately reflect real-life.