GPU Accelerated Method for Constructing and Rendering Trees

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Literature Review

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1 Introduction

This section will provide a brief description of the project, the areas of knowledge required to complete the project and a general roadmap for the projects progression.

1.1 Description

Generating natural environments can be costly. Creating and rendering realistic models of trees can be challenging. This projects goal is to investigate approaches for creating and rendering trees to be used in a real-time graphics application.

A key reason for wanting to include trees in computer generated environments is that trees, and other foliage, are what give life to that environment, a forest is not a forest without the trees and having an easy method of including trees in a landscape will mean that making that landscape more realistic and engaging becomes easier.

1.2 Knowledge

The key areas of knowledge required to complete this project are as follows:

- Branch Growth - The technical knowledge to produce natural looking branches will be most important to the success of this project, if the branches of the trees do not look naturally shaped then the final tree will not look realistic.

  The method used for naturally formed branches will be decided from researching multiple sources to find a suitable algorithm that can be implemented as efficiently as possible.

- Leaf Placement - Similarly to the issue of branch growth, the placement of leaves on the tree branches will also be important with respect to making the rendered trees look realistic.

  The method chosen will also similarly be researched from multiple sources to find the most appropriate algorithm for efficient implementation.

- Texturing - The textures applied to the trees after the geometry is finalised will not be as essential as the previous points but it will still play a key role in making the trees look realistic.

  A method will need to be used to correctly apply a bark texture to the trunk and branches of the tree without jarring edges being noticeable. The same attention will also need to be given to the leaf texture and the decision of whether to include some transparency in the leaves.

1.3 Roadmap

Literature review

Introduction: brief description of project, areas of knowledge required, roadmap	First	2.1	2.2	3	Fail
Discovery of suitable quantity and quality of material	First	2.1	2.2	3	Fail
Description of key issues and themes relevant to the project	First	2.1	2.2	3	Fail
Evaluation, analysis and critical review	First	2.1	2.2	3	Fail

Quality of writing

Clarity, structure and correctness of writing	First	2.1	2.2	3	Fail
Presentation conforms to style (criteria similar to conference paper reviews)	First	2.1	2.2	3	Fail
References correctly presented, complete adequate (but no excessive) citations	First	2.1	2.2	3	Fail

Revised Workplan (if applicable)

Measurable objectives : appropriate, realistic, timely	First	2.1	2.2	3	Fail

Comments

Supervisor: Dr. Stephen Laycock

Markers should circle the appropriate level of performance in each section. Report and evaluation sheet should be collected by the student from the supervisor.