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GPU Accelerated Method for Constructing and Rendering Trees

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Abstract

This project aims to convert and extend the Lindenmayer-system based tree construction method presented by (Prusinkiewicz et al., 1996) to be used as an independent OpenGL module. The module should allow the addition of trees to a real-time environment with minimal user interaction, avoiding the difficulties and expenses of manually producing tree models.

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1 Introduction

1.1 Context

Creating and rendering realistic models of trees manually requires advanced expertise with modelling software packages. This limits the ability to produce convincing 3D scenes for small developers with restricted resources.

The purpose of including trees in a natural environment is to provide realism. Trees are common natural structures present in even simple environments throughout the history of computer graphics and have seen many iterations as technology has advanced allowing for more detailed and realistic approaches.

The aim of this project is to provide a method for creating and rendering trees to be used in a real-time graphics application. This method should be simple to use and implement into an existing OpenGL project.

1.2 Related Work

References

Prusinkiewicz, P., Hammel, M., Hanan, J., and Mech, R. (1996). L-systems: from the theory to visual models of plants. In *Proceedings of the 2nd CSIRO Symposium on Computational Challenges in Life Sciences*, volume 3, pages 1–32. Citeseer.