REALISTIC TREE GENERATION

Aim

Improve the realism of the models produced by TreeDraw (an existing tree generator) through subdivision surfaces, texture synthesis and leaf generation.

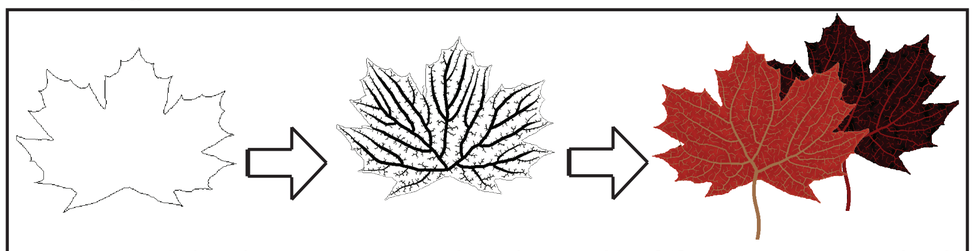
Leaf Generation

Vein generation based on biological processes.

Aim

Generated and distribute leaves across the tree model.

Design



User created sketch | Veins produced | Final leaf (front), Bump Map (back)

Results

Realistic leaves produced.

Real leaf

Rendered Leaf

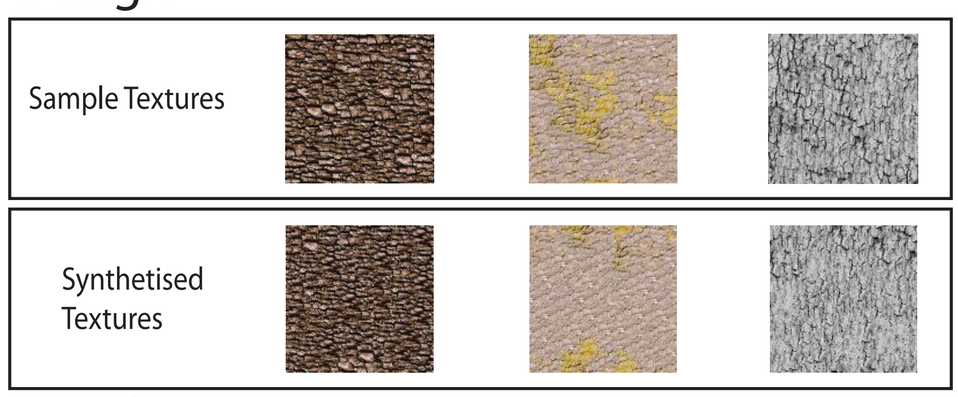
Texture Synthesis

A new texture is generated from a sample image.

Aim

To generate variations of a provided sample texture that are also tileable.

Design



Results

An experiment found that people perceive the synthesised textures as less realistic, likely due to an error in the analysis of the sample image (since corrected).

Subdivision Surfaces

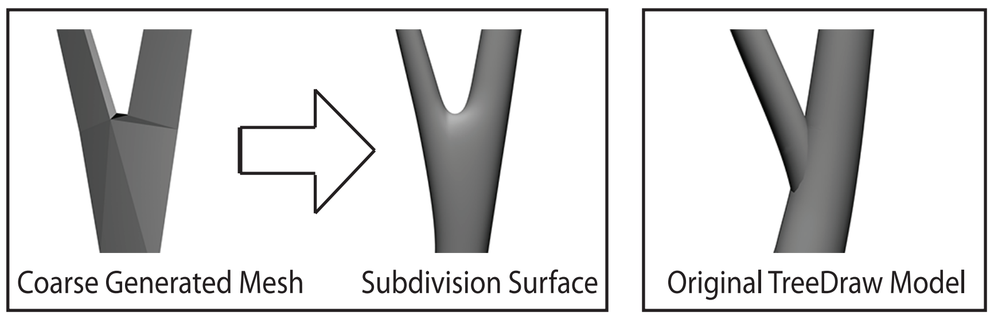
A method of approximating a smooth surface by iteratively subdividing the faces of a mesh and smoothing the vertex positions.

Aim

Emulate the smooth curves found in real trees.

Design

1) Generate a coarse mesh
2) Convert the mesh into a subdivision surface



Coarse Generated Mesh | Subdivision Surface

Original TreeDraw Model

Results

An experiment found that people perceive the subdivision surface as more realistic than the original.

Department of Computer Science

University of Cape Town
Private Bag X3
Rondebosch 7701
Email : dept@cs.uct.ac.za
Tel : 021 650-2663

Project Team

Ryan Mazzolini
Donovan Foster
Richard Pieterse

Supervisor

Associate Professor James Gain