

2018-2019

Proposta para Dissertação de Mestrado em Engenharia Informática

Title:

Simulation and Rendering of Weather Clouds in 3D Virtual Worlds and Digital Games

Supervisor:

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Abstract:

Simulation and rendering of natural phenomena have been important goals in computer graphics. Clouds, as a natural phenomenon, represent a real challenge because their birth, life, and death are amorphous and dynamic in nature. However, cloud simulation is very time-consuming when using physically-based methods. This work aims to develop a real-time cloud simulation method for mountain clouds based on SkewT/LogP diagrams, also called temperature/pressure diagrams. SkewT/LogP diagrams allows us to describe the vertical motion of a cloud in the atmosphere. Our cloud simulator can be incorporated into systems tied to important industries, namely movies, virtual environments, and video games.

Objectives

This work is in the field of computer graphics. The main objective is to develop algorithms for simulation and rendering of dynamic weather clouds for games that move over time in atmosphere.

Tasks:

This dissertation work will consist of the following tasks:

Task 1. The study of the main concepts behind weather clouds and understand their motion equation in atmosphere.

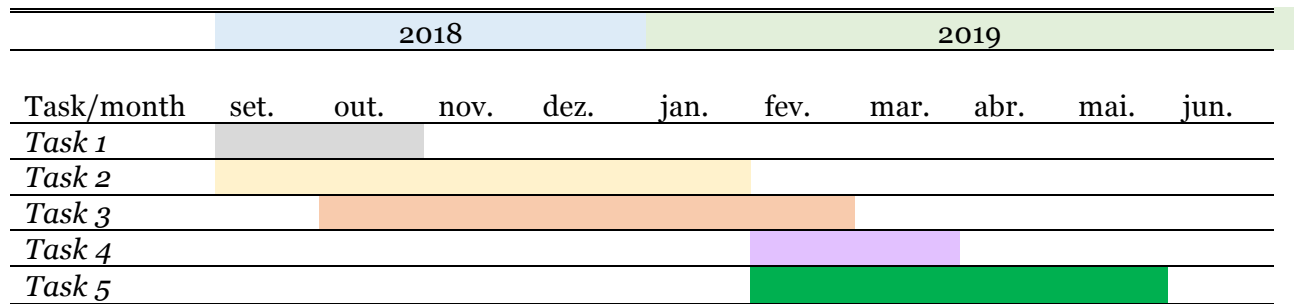
Task 2. To write a brief survey about the algorithms and tools to simulate and render weather clouds.

Task 3. To implement an algorithm for simulating/rendering weather clouds.

Task 4. To compare the algorithm to others (if publicly available).

Task 5. To write a paper to be submitted to a conference/journal, as well as the write-up of the dissertation.

Timeline:



Pre-conditions:

First. The student must have skills in computer graphics.

Second. The student must have a BSc degree with a minimum grade of 14/20.