Opponent record

Thesis compiled by: Veronica Ginman, Kim Malmros

Title of thesis: Visualization of smoke using particle systems

Opponent: Marcus Lundqvist

The underlying purpose of the thesis was to compute and render real smoke using particle system. The ease of understanding the thesis purpose was by the well written introduction. However, despite the well written introduction that introduce the application area and different techniques for rendering, the thesis purpose was not stated in plaintext. The authors do not refer to a purpose in addition to problem statement where they describe the goal of the thesis. In my opinion the authors omits the subjects purpose for the reader to do their own conclusion. The relationship between title and the content of the thesis has been captured in a good way. The authors have succeeded to create an interesting as well as a reflective title that consider the context of the thesis.

The thesis background section contains sub headlines such as history, smoke visualization and related work. These headlines provides comprehension about previous research and the behavior in both real and virtual smoke particles. The authors supply adequate information for readers to understand the reasons why particle systems behaves in a certain way, and also why there is research in this application area.

The approach chosen by authors have not been justified, however the thesis implies that a prototype is a good course of action since smoke particles by nature moves independently from each other and demands advanced computations. The authors makes the readers responsible of interpreting this instead of clarifying and illuminating the method chosen of tackling the problem. For this thesis the implementation was used to explore the methods of creating a realistic smoke with a prototype that is rendering units of particle system.

This study produced results which were both clear and concise. The authors also provided a demonstration between seven different visualizations. Although the results were clear and concise the authors omitted some metadata about the implementation and what they concluded from the implementation, previous research and visualization. In accordance to their own opinion, the visual result can not be considered realistic. This gives credibility to the conclusions since it exists a self-critical awareness. Considering this, the conclusions of this thesis seems reliable. One of the limitations with this thesis is that it does not consider sufficient sources. My thoughts is that the bibliography should at least contain three more sources. Nevertheless, the literature included in the bibliography are several studies and websites, and they are meaningful and accurate for the subject.

The report is well written and captures the readers interest. However, difficulties arise as mentioned earlier when a chapter leaves a gap and does not feel entirely complete. These sections are hard to understand and appears difficult to read. The thesis contains one such chapter, Results. In accordance to me it feels like the authors can expand the chapter containing metadata. Otherwise the thesis comprise good structure, provides interesting reading and a clear layout. A strong feature of the thesis is the ease of reading and the authors' ability to convey their message. However, the weaker features is the difficulties which the authors omitted such as describing an appropriate approach but instead leaves it to the reader for it's own interpretation.

An estimation of the news value of this thesis is that it is not pioneering such as the introduction in the 1980's. The authors refers to an already known method which will improve the rendering of the particle system and make it more realistic. The work of rendering smoke with particle systems has developed to a simple demonstration of a prototype. Another important practical implication is the evaluation of the outcome of the prototype. The authors provides both the behavior of real smoke from different sources and how well their prototype behaves.

Questions
1. Why is the selected approach more appropriate than a literature survey?

2. You say that an improvement can be done by parallelizing their position and transparency updating, why was this not adopted and have it already been adopted in previous research?

3. Why, do you think there exists a need for creating a realistic looking and behaving particle system?