# OPPONENT RECORD

**Thesis compiled by: Veronica Ginman & Kim Malmros**

**Title of thesis: Visualization of smoke using particle systems**

**Opponent: Magnus Olsson (magolsso@kth.se)**

***Was it easy to understand the underlying purpose of the project? Comments.***

**Yes, the objectives of the project were stated quite clearly already in the abstract, although I perhaps it should have been mentioned that the implementation was constructed in OpenGL. Reader interest may hinge upon which language/library was used. Apart from that, I believe the introduction presented the topic in a factual and concise way.**

***Do you consider that the report title justly reflects the contents of the report?***

**The title accurately reflects the major gist and purpose of the report. The one possible suggestion might be to mention OpenGL here already, or at least in a subtitle.**

***How did the author describe the project background? Was there an introduction and general survey of this area?***

**The authors addressed both the history of the technology known as "particle systems", as well as current uses. The background also gave a brief but informative description of how these systems are constructed and even some related fields, tying into physics and fluid dynamics. I think the quick introduction to the technology was appropriate and got the reader up to speed in an effective way.**

***To what degree did the author justify his/her choice of method of tackling the problem?***

**The authors did, in my opinion, not justify the choices made for the implementation at all, but merely stated the approach and structure of their implementation. I assumed from the start that their particle effect implementation utilized the GPU but later found indications of the opposite. That particular fact is something I might have wanted to see discussed further.**

***Did the author discuss the extent to which the prerequisites for the application of such a method are fulfilled?***

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**Is the method adequately described?**

**The method used is described in a structured and detailed way, devoting detailed paragraphs for each of the components of the finished implementation. This, together with the entire source code included in the appendix, shows the method in good detail. It is however not clear if any challenges arose and, if so, which reasoning was behind the choices that were made to tackle them. Again, as mentioned before, I would have preferred the reasoning for a CPU implementation over GPU to be addressed.**

### *Has the author set out his/her results clearly and concisely?*

**In this particular report the goal was mainly to try and achieve a realistic looking effect, which was presented mostly in terms of screenshots rather than words. Although it may not have been among the stated goals, some numbers in terms of frames per second would have been interesting, and to set them in relation to current state-of-the-art performance. The visualization was compared to real smoke however, which was in line with the purpose of the project. I felt that the results were mostly left up to the reader to look and judge themselves (this assuming you had not skipped ahead and read the conclusion chapter).**

### *Do you consider the author's conclusions to be credible?*

**The authors mention that their result is not entirely realistic looking, which I would consider to be a rational reflection. They do however mention that something does not always have to be realistic to give the viewer the illusion of realism, which I think is correct and an important point. They also discuss that performance was becoming an issue and some additional possible improvements were also suggested, which all made good sense.**

### *What is your opinion of the bibliography? What types of literature are included? Do you feel they are relevant?*

**The references citied range from websites and scripting documentation to published papers. All in all, a diverse but relevant collection of sources.**

### *Which sections of the report were difficult to understand?*

**Honestly I didn't find any section difficult to understand. The language is clear, simple and concepts are explained in an intelligible way. I didn't think any part of the report was needlessly cluttered with demanding language.**

### *Other comments on the report and its structure.*

**The structure had a clear and logical progression which was very appreciated. I don't think the authors made any needless excursions off-topic.**

### *What are the stronger features of the work/report?*

**The pace and clarity of the structure was refreshing. The report was not burdened by contrived language but was informative and interesting to read.**

*What are the weaker features of the work/report?*

**The work itself may perhaps not really add to the body of work that is particle systems. I also think that if the authors had tried with a GPU implementation, they would not have run up against performance issues and thus been able to simulate substantially more particles, making the result look much more compelling.**

*What is your estimation of the news value of the work?*

**As mention as a weak point, I don't think this really brings the field forward in any way. However, that is not something I expect or demand from a 6hp writing assignment.**

*Summarize the work in a few lines.*

**The authors looked at simulating and visualizing smoke using particle systems. A few state-of-the-art methods were discussed, after which the authors present their own basic implementation using OpenGL and C++. The results were displayed and discussed in relation to real smoke effects.**

**Questions to author:**

**1. Why did you not implement the particle effect using the GPU rather than the CPU?**

**2. Could you please present some numbers in terms of framerate and compare them to existing particle effects in current applications, such as modern commercial computer games.**

**3.**

**4.**

**5.**

**6.**