OPPONENT RECORD

Thesis compiled by:	Max Roth, Fredrik Hillnertz
Title of thesis:	Händelsestyrd vs. tidsstyrd simulering
Opponent:	Hampus Ohlsson

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

The underlying purpose of the report was very easy to understand and the problem statement was clear and concise. In particular, for me as a reader, I appreciated the different formatting of the two problem questions stated in the beginning – it made it very obvious what the report was going to investigate.

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

The title of the report is a perfect description of the contents. It is nothing more or less than a detailed comparison of the two chosen methods of simulation.

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

The background introduces the reader to the subject of simulation, and describes the different methods used. However, for a novice on the subject (like me), it would have been good to see a bit more general introduction to the topic, perhaps with some real world examples of how simulation is used in the industrial world today. Furthermore it would have been helpful to have some *brief* background about queue theory – different statistical theory terms are used such as Poisson distribution, perhaps these could be added to the (unfortunately missing) terminology list. Other than that, the background and description of the different simulation paradigms was sufficient to get the reader up to speed.

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

In the problem statement the authors clearly declares which type of models are going to be used for comparing the two simulation methods, a queue model and a percolation model. Even though these models are described in detail further down the report, there is no articulated reason why they are chosen. Why are these models appropriate or enough for comparing the two simulation methods? I believe the report will benefit from that information and contribute to a better understanding of the topic.

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

The methods of simulation are introduced in the background, and then further described in detail in the method section. As stated above, there could be some more information on the reason why the queue and percolation models are used.

Is the method adequately described?

The method is one of the strongest parts of the report. It is very well structured and guides the reader throughout the execution and implementation of the entire project. Everything is explained in detail with pictures, UML-diagrams and flowcharts, which make it easier to follow the reasoning in the text. The most important code implementations are given as pseudo-code inline with the text, which is very explanatory for understanding how the simulation works. A small adjustment for better code readability can be to change the typography to a mono-spaced font. But altogether, the method makes a very good job in describing the procedure and implementation to the reader.

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

The result section is very comprehensive and detailed. The different implementations are represented with distinct easy-to-read graphs, and then thoroughly evaluated and discussed form a couple of perspectives. In my opinion, one particularly good discussion of the result section is the measured error propagation for the different simulation methods, as certain parameters increase. This made it very obvious to the reader which method was more reliable and robust. As stated above, the result section is very comprehensive – almost to the extent that it is difficult to get a comprehension of exactly what the result is. Perhaps the result section could be shortened or begin with a summary of all the results, which definitely would make it more comprehendible for the reader.

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

The last part describes the results and definitely makes some credible and understandable conclusions based on the results. The authors also state it is hard to know which simulation method is the best since it depends on the circumstances, and consequently an alternative solution could be to combine the two methods into a hybrid. However, the final concluding sentence of the report is that such a hybrid solution has no guarantee to give any reasonable answers. This kind of uncertain reasoning seems to fit better in the discussion part of the essay than in the conclusion. Otherwise, the conclusion is sufficient and some general reflections of the results are presented, even though the concluding paragraph comes forward as somewhat ambiguous to the reader.

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

The bibliography uses a majority of online sources, but they are all publications of legitimate authors or major organizations or companies, which makes it credible. The literature includes a lot of programming specific documentation, as well as the Swedish dictionary SAOL. Overall, the literature used is definitely adequate and relevant for the report topic; I am almost surprised not more references were used.

Which sections of the report were difficult to understand?

The most difficult part for me to comprehend was the results section. Primarily because it was rather long (over 10 pages) and included a lot of different simulations and graphs – that made it hard to get an overview of the results. Perhaps the result section could be structured in a better way, or somehow modified to make it easier to appreciate the contents.

Other comments on the report and its structure.

The report has a good structure and a "red thread" that follows throughout the entire text. Some minor adjustments could be made to further increase the quality, such as changing the font of the pseudo-code, and also of the inline variable names. Other than that, the disposition and layout of the report is sufficient.

What are the stronger features of the work/report?

I believe the strongest part of this report is the method: the description of the implementation and execution of the different simulation methods. It was clear and straightforward, providing the reader with just enough information, not too much or too little, to understand how everything functioned.

What are the weaker features of the work/report?

I think the introduction was a bit short; a bit more general introduction on the topic of simulation models would give the reader a better overview and preparation for the remainder of the report. What are the typical uses of event/time driven simulations etc.? Also, I missed a terminology in the

beginning, for example the word *klustergraf* and other non-obvious words such as statistical theory terms can benefit from a description/definition in such a list.

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

The report makes an in-depth comparison of events driven and time driven simulation methods; the authors come to the conclusion that, if possible, event driven simulations would preferably be used. It has low error propagation and fast execution time independent of certain input parameters. This is valuable information for anyone who considers constructing a simulation model and weighing the method to use.

Summarize the work in a few lines

It is a well-written report that thoroughly compares two different simulation methods while carefully guiding the reader through the implementation and execution, step by step. It could be enhanced with a few adjustments, but overall it provides the reader with an interesting and educating experience in the field of simulation methods.

Questions to the authors:

1. What are some practical uses of event-driven/time-driven simulation models? Real-world examples?
2. Why did you choose to base the comparison on a queue model and a percolation model? Reasons?