Opposition for the project USAR-Robot Interface Evaluation

- Thesis compiled by: Jesper Bratt and Alexander Wilzek
- Title of thesis: USAR-Robot Interface Evaluation
- Opponent: Johan Wikström

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

Yes it was, but I didn't realize the exact set up until section 2.2 where it was described in greater detail. Since the word "robot" may mean anything from a primitive machine to a advanced cyborg I think that the report could benefit from adding a short description of the robots actually used in USAR missions very early. I also think that a short descriptive scenario could help explain the purpose at a earlier stage of the report.

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

There was a general survey of this area and they explained that there is a need for examining different interfaces. I did lack a use case scenario however. Apart from that the survey felt well supported and the need for the project was supported.

To what degree did the authors justify their choice of method of tackling the problem?

The authors mentioned that they have made a comparison between two different rendering tools, but make no further justifications of their choice of method.

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

Not very much. They mainly state that they need a variety of tools and do not discuss the prerequisites of using these tools. They do provide some measure of correlation between the different tools. To render objects in Unity, we need the 3D tool Maya, etc.

Is the method adequately described?

Yes, the simulations are very accurately described with the correct amount of details. The images are very describing and it is easy to follow the descriptions.

Has the authors set out their result clearly?

The results are set out in numbers and graphs which is quite clear. I do miss some explaining text however. They mention that it is now apparent which interface is easier to use, but they never explicitly say that it is interface 3 and the results from the other interfaces are put away in an appendix.

I miss explaining text for the test results and I miss a comparison between the different interfaces. Section 3.2.2 is named time trial time and the only text in the chapter is a listing of numbers and their mean. Which interface do these belong to? Do they belong to all interfaces and if not, what are the numbers for the other interfaces? The same thing applies to section 3.2.4.

In section 3.2.6 the question is "Did you find the robot hard to maneuver?" and the answer is a graph containing the results from one interface with unlabeled axes. One between 0 and 8 and the other between 1 and 10. It is possible to guess what the axes mean, but I lack some explaining text here.

I would also like to see graphs comparing the different interfaces so that the reader could actually see the proof of the implicit statement that interface 3 is the easiest to use.

Do you consider the authors' conclusions to be credible?

Yes I think that they are credible. They do not seem to have drawn any wild conclusions from their data. They also base their conclusions on data mentioned in the discussion and results.

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

The bibliography is quite relevant and comprehensive. The implementation phase of the project is described comprehensively and has several references. Most of the references are to web pages and many of them are concerning Unity. I do miss some references to literature on the background of this project. The only reference about the background I could find was some sort of slide show in reference 3. The bibliography does not seem to be sorted after any recognisable order.

Which sections of the report where difficult to understand?

The report section was hard to understand since it lacked explanations for the graphs and comparisons between the different interfaces. I did not understand that the objective was to control the robot manually until section

Other comments on the report and its structure.

The "why unity" section should be much earlier in the report since that is something that the reader wonders throughout the report. It is mentioned that there is a good reason, and there is, but that reason should be in the background and not in the "Discussion" section. Also, the decision to choose Unity is mentioned at least four times in the text. This could be considered a little too much meta-information since the decision to choose Unity could be explained and motivated in the background section only.

What are the stronger features of the report?

The strongest feature of this report is that the simulations are very accurately described and that the user tests performed give weight to the conclusions and discussions.

What are the weaker features of the report?

The weaker features of the report are the results section, where it is lacking explanatory text and comparisons, and the background section which could have contained a more comprehensive description of the problem and prerequisites as well as the explanation to why Unity was chosen.

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

I think that the news value depends on the comparison between the three interfaces. If there are great differences in usability, the news value is higher and if there are small differences in usability, the news value is lower. Unfortunately, since the results section does not explicitly compare the three interfaces, one would have to compare each graph in the appendices against the corresponding graph in the results section to determine news value.

Summarize the work in a few lines.

This report evaluates three interfaces for controlling "Urban Search And Rescue" vehicles. A study is performed on test subjects who are tasked to steer a model of a USAR-Robot through simulated disaster zones. It is determined that an interface with a third-person camera combined with a birds-eye view is the most appropriate of the interfaces tested.

Questions to author

1. Is the third person view realistic? Does it have a counterpart in real USAR robots?
2. Is the birds eye view realistic?
3. Is the robot used a realistic model of a USAR robot? How realistic?