Status report

# The model

The implementation has reached a stage where the control algorithm can be easily developed and analyzed with an instant feedback, both with statistical variables that indicate the quality of the model as well as matlab plots that gives a graphical view of the performance.

As described in the report, the structure of the model is simple:

1. Create all objects used in the simulation, i.e all balloons, wind layers and the grid which represents the world.
2. Start simulation

The simulation is the looping of following steps:

1. Apply decision, i.e run the control algorithm to determine whethere the balloon should start navigating towards another wind layer
2. Apply wind. Move the balloon according to the wind direction of its current position.
3. Update statistics and print to file

The file generated is then used by a matlab script to create graphs for visualization. As it stands now, I manually choose which “decision algorithm“ the simulation should use, and it is easy to generate a lot of statistics of multiple algortihms to analyze and compare.

The current status of the model is the development of various control algorithms. Comparing and exploring different tweaks to the algorithm to see which is most effective and what factors are the key to good performance. I have two GUIs to analyze the performance of a control algorithm. One is pure textual GUI which runs a full simluation and returns statistics and a file containing the coverage over time, which then is plotted with a matlab script. The other GUI is more graphical and allows me to run the simulation step by step and see graphical representation of the ballloons and how they spread around the grid.

# Version control

I am using [www.github.com](http://www.github.com) to keep track of my implementation. The repository is public and you can clone it using the following link: <https://github.com/karithrastarson/loon_java.git> I create a new branch for new features in case I need to switch to an earlier version of the model quickly.

# The report

The structure of the report is ready and well on its way and most of the titles are in place. All LaTex related issues have been taken care of and the references are in good shape. I am using [www.sharelatex.com](http://www.sharelatex.com) with a Dropbox integration for the LaTeX project and [www.mendeley.com](http://www.mendeley.com) to keep track of all references and to auto generate a bibliography. Attached you can find the current status of the report as it stands today.

# Coming up

* Finishing and maximizing the performance of the model. I will do that by continuing to tweak the control algorithm incrementally. Each algorithm becomes more complex and more “computingly“ demanding. The data for each algorithm is gathered to show the progress of this development.
* Gather all data and describe all limitation of each algorithm.
* Finish chapters in the report that will not be become outdated with the new algorithms.
* Create diagrams and explanatory graphics to support the descriptions of the model.
* Extend model – introduce “static balloons” or cell towers, that will serve as a communications hub between balloons. This will be introduces into the best performing algorithm.