Research Plan Force-directed Graph Drawing

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1 intro

Data requires often visualization before people understand what it means. This visualization is done with graphs and charts. This research focusses on the drawing methods of graphs. These graphs consist of objects and the relations between eachother. In graph theory the objects are called vertices and their relations edges. Generating readable graphs becomes difficult according to the amount of vertices and edges. To generate these correctly many algorithms were developed. One family of functions to do this is called *Force Directed Graph Drawing*. The idea behind force directed graph drawing is to use physics based algorithms to calculate the positions of each correctly. In this research a few algorithms wil be examined and how correctly they can generate a graph. Not only will we compare different algorithms, we will also inspect how some algorithm-specific constants influence the results.

The algorithms that will be subject to our research are as follows:

- Hooke-Coulomb's Algorithm

- The Fruchterman Reingold Algorithm

- Eades' algorithm

More on these and the constants are in subsection 1.1.

1.1 Algorithms

As this paper focusses on the algorithms behind force directed graph drawing, the most important part of it are the researched algorithms. Most of these algorithms are (partially) based on physics.

1.2 Hooke-Coulomb

The Hooke-Coulomb algorithm is not named after its inventors, but after the laws it follows.

1.3 Fruchterman Reingold

The Fruchterman Reingold algorithm on the otherhand is named after its inventors. [1]

1.4 Eades

2 Research Question

Which force directed graph drawing algorithm yields the highest quality graphs?

3 Problem Discription

3.1 SAMENVATTING (SOORT VAN) VAN HET VORIGE VERSLAG

4 The Experiment

5 Result Data

5.1 Tabellen

5.2 Grafieken

5.3 Toelichting

5.4 Statistische Hypothese

5.5 De uitwerking hiervan

6 Conclusion Discussion

7 Reflection

References

[1] Thomas MJ Fruchterman and Edward M Reingold. Graph drawing by force-directed placement. *Softw., Pract. Exper.*, 21(11):1129–1164, 1991.