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# Adaptation of the Dijkstra Algorithm for Satellite Navigation by Applying and Further Optimising Speed Factors



## Introduction

Satellite navigation applications are one of the most commonly used applications used (77 % of mobile phone users), thus defining a very competitive software application market.

The aim of this project is to adapt a satellite navigation system to provide a quicker route to a particular destination. This was achieved by testing Dijkstra's path-finding algorithm and optimising it for a navigation system through the use of weighting factors



## Summary

Research was carried out on speed factors to show how vehicles may reach their destinations more quickly.

Realistic results were achieved by optimising the data through tests. The results were measured in a car to find the time of a route.

The algorithm the predicted that time and the results were recorded.

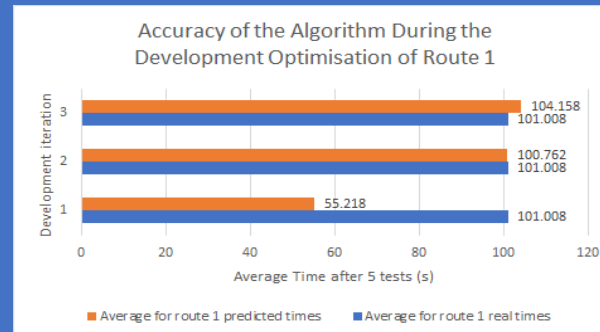
The results were then evaluated by comparing how close the algorithm came to the real times.

## Methodology

There are many factors which affect the speed of cars. These factors may affect a car's speed at any given moment and such speed factors include traffic lights, speed factors include traffic lights, speed inhibitors, traffic data and the state of a road surface.

The application will apply speed factors to the algorithm by randomly affecting distances between latitude and longitude points based on the probability that certain speed factors occur.

The application will calculate the optimum route based on the speed factors.



- A graph showing the development of the algorithm over the optimisation process. The graph compares average times predicted for route 1 compared against the average real time of route 1 at different stages of development.

## Future Plans

\*This project may contain a feature which may have the ability to predict times based on current car speeds.

\*A future implementation of this application could contain live traffic (ie. The ability to track user's locations in order to produce route times).

\*Another idea that could be taken further is to use Text-To-Speech to navigate users by voice commands based on points of interest (e.g. "turn left after the Robertson's café.").