

**Pathfinding for Persons with Reduced Mobility -
Comparing the performance of
routing-algorithms given physical and
environmental restrictions**

Final Report for CSM6960 Major Project

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Abstract

Route-planning applications are designed to help their users find good paths between two or more locations on a map. These systems are useful to a wide variety of people – like tourists travelling to unfamiliar areas, or companies wanting to minimise fuel-costs and/or travel-time for their delivery vehicles. Route-planning can even be a useful tool on planes and boats, as it can help guide vessels into areas where the forces of nature give less resistance, or away from restricted/dangerous areas, but that is outside the scope of this project.

Conventional route-planning software is often aimed at one or more large groups of specific users – like motorists (commercial and/or private), pedestrians, cyclists, etc. But very few of these systems are able to plan good – or even practical – routes for Persons with Reduced Mobility (*PRM*), as these users are often simply grouped together with pedestrians or cyclists; with no special consideration taken with respect to their physical limitations.

Built-up areas pose particularly difficult environments to navigate for PRMs, as many commonly encountered obstacles like stairs, non-automatic doors, curbs, and steep slopes are effectively impassable for people with certain physical limitations. Without the aid of a route-planner, PRMs would need to rethink their planned route to a location on the fly whenever they encounter an obstacle, which can often prove quite frustrating, as an accessible path to where they want to go may not even exist.

The route-planning application described in this paper tries to address the aforementioned issues by identifying and avoiding inaccessible areas, and using accessible buildings as shortcuts in an attempt to shorten the route returned to the user. A number of different pathfinding algorithms have been tested, each of which has its own advantages and disadvantages.

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5.1 Completed work

Occasional `NullPointerException`s (and a few other exceptions) when running the system. Problem originates in Mapsforge's code, not mine. Example: unable to load map-tile...

5.2 Future work

Appendices

Appendix A

Third-Party Code and Libraries

Appendix B

Code samples

2.1 Examples of test-classes

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