Fachpraktikum Algorithms on OpenStreetMap Data: eMaps

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Abstract

Electric vehicles, such as eBikes or eCars, play an important role in today's

1 Introduction

Climate change and its consequences heavily impacted the engineering of means of transport. As a result, vehicles powered by electric batteries emerged, such as electrically-powered cars, bikes or scooters. By using regenerative energy sources, electrically-powered vehicles have the potential to significantly reduce the dependency of fossil fuel reserves [AHLS10]. Furthermore, electric vehicles emit no emissions, hence, being more eco-friendly than vehicles running on gasoline. However, electric vehicles have characteristics that currently hinder its wide-spread adaption, i.e. (i) limited cruising range, and (ii) long recharge times[AHLS10]. Especially the limited cruising range require an adaption of existing navigation and routing systems. We need to determine routes for electric vehicles considering the availability of charging stations and the range of electric vehicles to avoid running out of power.

Using OpenStreetMap[1] data, we demonstrate the implementation of a route planner based on the range of an electric vehicle and the availability of charging stations.

2 Key concepts

2.1 OpenStreetMap

2.2 Dijkstra

3 Implementation

3.1 Architecture and Technologies

3.2 Features

4 Conclusion and Future Work

References

[AHLS10] Andreas Artmeier, Julian Haselmayr, Martin Leucker, and Martin Sachenbacher. The shortest path problem revisited: Optimal routing for electric vehicles. In Rüdiger Dillmann, Jürgen Beyerer, Uwe D. Hanebeck, and Tanja Schultz, editors, *KI 2010: Advances in Artificial Intelligence*, pages 309–316, Berlin, Heidelberg, 2010. Springer Berlin Heidelberg.

[1] `https://www.openstreetmap.org`