

Most mainstream web mapping applications implement location-based direction search. The typical workflow involves constructing an explicit sequence of places to visit. In this thesis, we aim to develop a web application that lets users formulate search queries in terms of categories, each composed of a keyword and attribute filters. A resulting route passes through at least one place from each category. The search procedure is formalized as a variant of the generalized Traveling Salesman Problem and solved with the help of polynomial-time heuristics.

The application follows the three-tier architecture pattern. The frontend is implemented as a single-page application written in TypeScript using the React library, while the backend is programmed using the ASP.NET framework. We utilize the OpenStreetMap dataset and two knowledge graphs, Wikidata and DBPedia, as the basis for the conceptual model. Data is preprocessed and stored in MongoDB, which also serves as an efficient index. The OSRM routing engine helps calculate shortest paths and estimate network distances.

Last but not least, the application stores user data in a decentralized way, either in IndexedDB or a Solid pod. The former is a standardized in-browser database, while the latter is part of an emerging technology that gives users control over the physical location of their data and access rights.