ABSTRACT

The size of the explanatory note is 88 sheets, and contains 15 illustrations, 10 tables, 4 appendices, 43 references to sources.

The topicality of the topic is due to the increase in the number of people moving in wheelchairs and the lack of a service with a sufficient level of detail and flexibility for building, planning and optimizing routes within the city.

The aim of the research is to improve the quality of route construction in navigation systems intended for people in wheelchairs, in the way of developing an algorithm, method, and software with the possibility of using and updating information about the quality of inclusive infrastructure in real time.

The object of research is the process of building routes in navigation systems intended for people in wheelchairs, taking into account many optimality criteria.

The subject of research are algorithms, methods, and software tools used in navigation systems to improve the quality of routes intended for people in wheelchairs, taking into account many optimality criteria.

To achieve the goal, the following tasks must be solved:

- to analyze the existing navigation systems, algorithms and methods of building routes for people in wheelchairs;
- to develop a method of construction and multi-criteria optimization of the route;
- to develop the architecture of the navigation system for people moving in wheelchairs;
- implement a web navigation service using the proposed method and architecture;
- perform experimental studies.

Scientific novelty: the architecture of the navigation system has been developed for the application of the developed method of construction and multi-criteria optimization of routes based on the genetic algorithm and the modified Dijkstra algorithm.

The practical significance of the obtained results lies in facilitating the mobility of persons with limited physical capabilities and providing them with access to the city infrastructure, in the way of providing open access to the created web navigation service.

The research results have been tested and published at scientific and practical conferences, which confirms their relevance and scientific value.

Publications:

- Petryna V.M., Baklan I.V. A genetic algorithm for the problem of multi-criteria optimization of a route on a graph. Abstracts of the SoftTech-2024 conference.
- Petryna V.M., Baklan I.V. Implementation of the genetic algorithm for the problem of multi-criteria optimization of a route on a graph. Abstracts of the 4th international scientific and practical conference "Progressive science and achievements" May 16-18, 2024.

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