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FUNCTION TO ADJUST THE ROUTE GUIDANCE FOR PEDESTRIANS AND CYCLISTS

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FUNCTION TO ADJUST THE ROUTE GUIDANCE FOR PEDESTRIANS AND CYCLISTS

Technical task:

The technical task of the invention is the user-friendly navigation of pedestrians and cyclists.

Initial situation:

Turn-by-turn navigation for pedestrians and cyclists (e.g. cyclists or scooters, e-scooter users) is currently carried out in particular with the aim of reaching the destination as quickly as possible and/or with the shortest possible distance. For pedestrians and cyclists themselves, however, it is not only the distance and duration until reaching the destination that are important for the route selection, but also other criteria (e.g. comfort, safety and local weather conditions on the route). In currently implemented approaches of turn-by-turn navigation for pedestrians and cyclists, criteria relevant for this user group are not taken into account for route selection (e.g. comfort, safety and weather conditions on the route). Accordingly, non-optimal routes are offered for these user groups, resulting in low user satisfaction and frequency of use. Providers of navigation functions for pedestrians and cyclists, on the other hand, unfortunately do not gain insight into the complete mobility behaviour of the users. It is therefore not possible to develop and offer tailor-made mobility functions and services.

In this area, patent applications EP2372305A2, US2009157302A1 and DE102012218064A1 already exist. In these, especially (relatively) static information (e.g. map information, police statistics, weather) is taken into account, on the basis of which the routing is adjusted. The evaluation criterion is in particular the safety of pedestrians and/or cyclists (EP or US patent application) or an adaptation of the routing to pedestrians with mobility restrictions to ensure the usability of the proposed route (DE patent application). The present invention goes beyond these functions.

Solution:

In order to avoid the mentioned disadvantages, a function for adjusting the route guidance of pedestrians and cyclists is proposed. This function is based on information about possible route alternatives, which can be used to evaluate the quality of route sections. Examples of relevant information in this context are given (relevant data source in square brackets):

- Time of day (e.g. sunrise/set) [calendar].
- Local real-time weather (e.g. temperature, sun/shadow, rain, sleet, snow) [Weather Station, Black Data].
- Road condition (e.g. holes, leaves, winter road maintenance) [Black Data].
- Map information (e.g. pedestrian/cycle paths, canopies, shelters, building height, trees, traffic lights, pedestrian crossings, separation of pedestrian/cycle paths and streets, parking vehicles) [database].
- Road surface (e.g. gravel, tar) [database].
- Police statistics (e.g. crime, accident black spots with pedestrians/cyclists) [database].
- Illumination level of the surroundings (e.g. by lanterns, advertising, window lighting) [black data].

From the integration of this information (for example, in a backend server), a valuation index for a route section can be generated in a further step. This valuation index can be adapted to the corresponding user group and/or individual preferences.

For example, a route section is marked as particularly safe for pedestrians under the following conditions:

- Time of day: Day
- Weather information: no impairment
- Road condition: dry
- Map information: pedestrian path available, separation of sidewalk and bicycle path/road, none visibility obstruction by parked vehicles
- Road surface: tarred road, no holes
- Police statistics: no accident black spot with pedestrians
- Illumination level: irrelevant

Accordingly, other characteristics of these categories lead to more negative characteristics of the safety index for road sections from the pedestrian's point of view.

A route section can also be evaluated with regard to other objectives or other user groups. Examples:

- A road section is favourable in summer, for example, in terms of avoiding heat and/or strong sunlight, if the section is in the shade at a given time or canopies protect pedestrians/cyclists.
- A section of road is favourable in winter, for example, if the winter service has removed black ice and/or snow.

This information can finally be made available to the pedestrian and/or cyclist. The following variants would be conceivable:

- Availability of the information in navigation maps (e.g. as a note/warning)

- Adaptation of the route selection (e.g. avoidance of direct sunlight in summer)

Advantages:

The proposed procedure provides pedestrians and cyclists with better quality route suggestions to reach a destination. This is expected to result in higher user satisfaction and a higher frequency of use of corresponding navigation functions. At the same time, the providers of corresponding navigation functions will receive comprehensive data on the mobility behaviour of the user groups, which will enable them to develop and offer suitable mobility functions and services for the individual user.

Possible application:

The core of this idea is

- Database with pedestrian/cycle paths, roofing, shelters, building heights, trees, traffic lights, road surface, pedestrian crossings (e.g. via high-precision map)
- Database with calendar information (e.g. sunrise/set)
- Determination of the local real-time weather (e.g. via weather stations, swarm data)
- Determination of the road condition (e.g. holes, completed winter road maintenance; e.g. via black data)
- Database with police statistics (e.g. vandalism, parking accidents)
- Determination of the degree of illumination (e.g. via black data)
- Integration of the above information to determine a security index for route sections (for example, in a backend server)
- If necessary, making the information available in navigation maps
- Adjustment of the route selection if necessary