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IDPA-SYSTEM - INTELLIGENT DAMAGE PROTECTION ASSIST

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IDPA-SYSTEM - INTELLIGENT DAMAGE PROTECTION ASSIST

Technical task:

Due to the increasing problems with storms caused by global weather changes, it is more and more common for drivers to be suddenly confronted with a bad weather conditions and in this connection hail and heavy rain. As a result, the driver of a motor vehicle is exposed to the situation without protection, especially if he is not familiar with the place, for example on holiday or abroad. Particularly in the event of a very rapid and unexpected change in the weather, it is difficult for the unfamiliar driver of a motor vehicle to park his vehicle safely in a sheltered place, such as a covered parking area, or to find a shelter for a short time until the storm has left.

Initial situation:

This circumstance is made more difficult by the fact that the weather event suddenly leads to damage to the vehicle and puts the driver of the vehicle in a panic situation, which leads him to act inconsiderately. It is not uncommon for the driver to change his route inconsiderately and sometimes hectically, hoping to leave the storm area or find a public parking space. Exactly the opposite happens - he drives directly into the storm because of a wrong assessment of the weather situation/traffic situation and because of a lack of local knowledge or gets into a traffic environment caused by a traffic jam, which does not allow him to continue driving.



Figure 1



Figure 2



Figure 3



Figure 4

Solution:

The approach of the idea is to use an assistance for the traffic/vehicle situation described above. The task is solved with the help of a front camera, an outside microphone and/or knock sensor, preferably under the hood, an interface to the windscreen wiper cleaning system and a link to the GPS/navigation system of the vehicle.

In the case of storm-like environmental conditions such as hail with driving rain described above, a route proposal is offered to the driver depending on the image documentation of the front camera and the simultaneous detection of hailstones striking the bonnet extremely hard. This enables the driver to steer his vehicle as quickly as possible (on the shortest route) to a protected location. Protected locations are, for example, roofed parking lots, such as large shopping centres, multi-storey car parks, petrol stations, pent roofs of storage areas (etc.).

The suggested route is calculated based on image data of the front camera, which detects precipitation together with the microphone and/or a knock sensor under the bonnet. The current route, which has been changed due to the storm, is compared in real time with the direction of movement of the front of the storm after the first "vehicle-damaging" classification/evaluation and the best location of a sheltered, covered parking space is offered as a new destination or intermediate destination. The GPS system takes the traffic situation into account and avoids time-related stops, such as traffic lights and/or roads with traffic jam potential.

The aim of the IDPA system is to provide the driver of a motor vehicle with intelligent assistance that enables him to manoeuvre his motor vehicle out of the danger zone as quickly as possible, stress-free and without panic in a storm, in a first processing step. In a second processing step, the system also offers extended route assistance if required.

In a special version, the driver can confirm the automated assistance request via a "machine/man" interface and/or can request assistance directly via voice input, such as the "hail protection" command.

Advantages:

- All electronic modules of the described assistance system are available in a premium vehicle and only need to be operated via an intelligent control program/interface in order to provide the above storm assistance.
- Increasing storm problems due to global weather changes, in particular the storm-like situation in Europe in connection with increasing traffic density, such as in cities with increasingly confusing urban traffic planning, i.e. with increasingly narrow, dense buildings.

- Problem of the increasing optical damage/insurance damage in the course of the lightweight construction strategy: Reduction of the sheet thickness and increased tendency of bulges in connection with a statistically proven increase of thunderstorm as a result of global weather changes.