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GPS-BASED REGIONAL 3D MAP CONSTRUCTION

The problem. Geographic information systems became really popular and widely spread when such everyday devices as smartphones or tablets were bundled with built-in GPS receivers. Almost anyone can use this feature for his or her smartphone when applying in an unknown place to find the route somewhere or to find some points of interest.

But not only the mobile device users come across this problem. Many personal computer or laptop users face the problem of finding the route between two points on a map.

Thus, the geographic information systems and mapping systems are constantly being developed as more user-friendly and more informative ones. They should provide as much data as possible to help user orient on the map.

The more detailed and close to reality map region is drawn on a display, the more features and functionality the user gets. It will definitely improve user experience.

The research purpose. Development of the application for geographical route along with the route set of the certain region tracking and rendering. The main goal of building such 3D tracks is to create a regional road map to help people orient and navigate better (faster).

The problem solution includes these tasks:
- Analysis of existing tracking and geographically-positioning devices for special and common use purposes.
- Development of a software system for route tracking.
- Development of the route reconstruction algorithm.
- Prototyping and development of rendering and visualisation software.

Novelty. Developed software- and hardware- complex for road surface analysis and visualisation using portable common purpose- GPS-powered devices.

Practical significance. The developed software complex is a part of a bigger software-and-hardware complex for Ukrainian road surface analysis and visualisation. The complex is aimed to provide the detailed information on the road condition in Ukraine.

The system is developed for the future practical involvement within the Orion laboratory.