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Design of an Air and Land Multi-Element Expression Pattern of Navigation Electronic Map for Ground Vehicles under United Navigation Mechanism

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Abstract : At present, there is much research on the application of centralized management and cross-integration application of basic geographic information. However, the idea of information integration and sharing between land, sea, and air navigation targets is not deeply applied into the research of navigation information service, especially in the information expression. Targeting at this problem, the paper carries out works about the expression pattern of navigation electronic map for ground vehicles under air and land united navigation mechanism. At first, with the support from multi-source information fusion of GIS vector data, RS data, GPS data, etc., an air and land united information expression pattern is designed aiming at specific navigation task of emergency rescue in the earthquake. And then, the characteristics and specifications of the united expression of air and land navigation information under the constraints of map load are summarized and transferred into expression rules in the rule bank. At last, the related navigation experiment is implemented to evaluate the effect of the expression pattern. The experiment selects evaluation factors of the navigation task accomplishment time and the navigation error rate as the main index, and make comparisons with the traditional single information expression pattern. To sum up, the research improved the theory of navigation electronic map and laid a certain foundation for the design and realization of united navigation system in the aspect of real-time navigation information delivery.

Keywords : navigation electronic map, united navigation, multi-element expression pattern, multi-source information fusion
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