path planning of a large area, so it is impossible to completely load road network data in a computational domain into memory. In the paper, therefore, when verifying the algorithm's validity, the Dijkstra algorithm based on hierarchical search and the hierarchical search A* algorithm based the transformation of road network are respectively used to compare the efficiencies of path planning. Fig. 5 shows the chart for time comparison of path planning among different cities of China after using two algorithms are used respectively.

It can be seen from Fig. 5 that two algorithms use the hierarchical search strategy when path planning in China, so both of them have higher computational efficiency. In search of the next section, the hierarchical search A* algorithm based on the transformation of road network uses the distance away from the end point as the measurement to evaluate the possibility of this section locating in the optimal path, and can first search the section with a great probability, so, its search efficiency is superior to that of the Dijkstra algorithm based on hierarchical search. In addition, when path calculation, the hierarchical search A* algorithm based on the transformation of road network uses the method of transformation of road network to transform node weights into an arc (section)-based weighted directed graph, and then the optimal path is calculated in the transformation of road network, therefore, the algorithm can identify and deal with all kinds of traffic control information and the influence of intersection delay.

The practical navigation application shows that the hierarchical search A* algorithm based on the transformation of road network has many advantages in calculating speed, path rationality, etc., and is able to satisfy the technical requirements of real-time navigation application under the embedded environment.

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