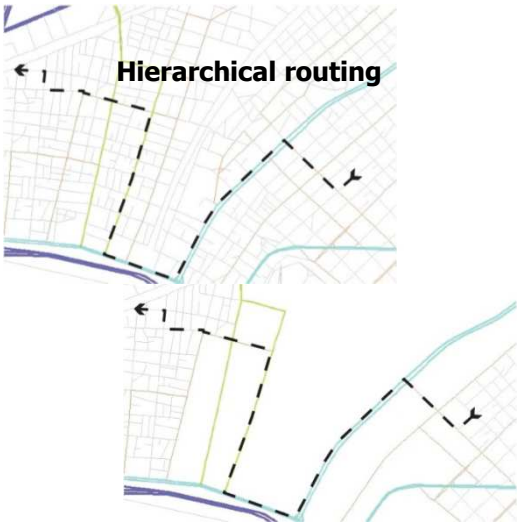
Υπηρεσίες Δυναμικής Δρομολόγησης

GIS υπηρεσίες για οδικά δίκτυα - Hierarchical Routing Algorithms

Time is money becomes a very concrete and meaningful statement when considering it in the context of routing and navigation applications. A quote from the field of transportation logistics suggests that saving 5% in transportation time translates to 25% added profit! This fact should be a more than adequate motivation for the development of methods that efficiently support the computation of dependable routing solutions.

The essential components of a **navigation system** are (i) a **shortest- path algorithm** and (ii) a **map dataset**. In order to deliver high quality routing solutions to users fast, algorithms need to be efficient and road networks up-to- date. We introduce **the HBA* algorithm, a bidirectional version of the A* algorithm that utilizes road network hierarchies to achieve faster computation times**. The HBA* uses hierarchical jumping, a technique that favors the use of the higher category roads to reduce the overall search space and to significantly improve the running time of shortest-path computation.



To test the algorithm, we use **dynamic travel times** to assess the performance of our shortest-path algorithm (i) in relation to existing solutions (HBA* vs. A*) as well as (ii) to assess the effect of the dynamic travel times on the quality of routing solutions. Dynamic travel times are **derived from vehicle tracking data also commonly referred to as floating car data (FCD)** or probe vehicle data (PVD). Large collections of such data are used to derive trends in the travel time behavior for road networks. To compute shortest-path solutions, dynamic travel times allow us to find more accurate solutions when compared to static weights as provided by map data vendors. For this study, large amounts of historical FCD have been collected over a period of 2 years for the road networks of Athens, Greece and Vienna, Austria.

Through experimentation it was established that the HBA* outperforms existing routing solutions by a magnitude while at the same time providing shortest-path solutions of comparable quality.

Floating car data and speed profiles

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