PhD study on line generalisation for nautical chart construction

Background of research

Nautical charts are mainly composed of soundings (depth points) and isobaths (contour lines). Sounding selection and contour simplification is a process called generalisation and is done according to the scale in order to represent the seafloor morphology and indicate safe routes for navigation. This last constraint imposes specific rules and works done for other types of map are not applicable to chart generalisation. As a consequence, the generalisation process still relies on manual processing.

In order to move towards automation, a set of operators for line generalisation (deletion, smoothing, displacement and aggregation) based on energy minimisation techniques (active contours) has been developed. However, contextual information such as line topology and terrain morphology is not taken into account.

Objective

The objective of the project is to develop a generalisation strategy for isobaths based on the definition of topological and geometrical rules respecting chart constraints. The work consists in extracting morphological structures from a set of contour lines and in generalising the lines by combining generalisation operators while preserving the morphological structures.

Profile

The applicant should have an MSc Degree or equivalent with a research component related with spatial data analysis and modelling and should have reached a good level in computer programming.

This research is done in collaboration with the Geographical Information Science group of the Research Institute of the French Naval Academy (IRENav) in Brittany, France. The candidate is expected to do his research partly in France and in Hong Kong.

Contact

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