

Vario-scale geo-information can be made to work!

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Abstract:

During this presentation we will give a wrap up of the results of the STW research project titled 'Vario-scale geo-information' (<http://varioscale.bk.tudelft.nl/>).

The scale of a map is defined as the ratio of a distance on the map to the corresponding distance on the ground. Humans have been using the concept of map scale since the early days. When moving to a digital environment, the old map scale concept is maintained and for each different scale the whole data of a map are separately produced and stored. This is a labor intensive and expensive process and in practice results in inconsistencies. We proposed a new concept named 'vario-scale' where the data – once stored in a vario-scale data structure – can be used for generating all wanted scales in a smooth digital way.

Encoding of vario-scale geo-information can be based on:

1. 2D primitives + 1D scale range (in a specific data structure, called tGAP - topological Generalized Area Partition), or;
2. Can also be based on full 3D geometry (where 1 dimension depicts how objects change over scale) resulting in a structure we call the Space Scale Cube (SSC).

The second representation can result in a description of how objects change gradually/smoothly over scale, which is infinitely adjustable, Fig. 1 gives an illustration. Producing a 2D map can be performed by calculating intersections of the 3D space and a surface. Normally this slice plane is flat and horizontal. Moving the slice plane slightly up or down, should lead to a map that is only changed slightly. This paves the way for making smooth transitions, while interacting with the data (e.g. zooming in or out) and also making progressive transfer of the data possible (sending additions to what was already send over the network).

Furthermore note that also curved surfaces can be used for slicing, leading to fish eye maps (enlarged locally). A nice property is that because the input forms a partition of 3D space, the resulting map is provably also a partition.

We will include in the presentation:

- An explanation of the concept - What is vario-scale and how we can create implementations of it?
- Latest developments - what has been implemented and achieved so far;
- Some plans for the (near) future.

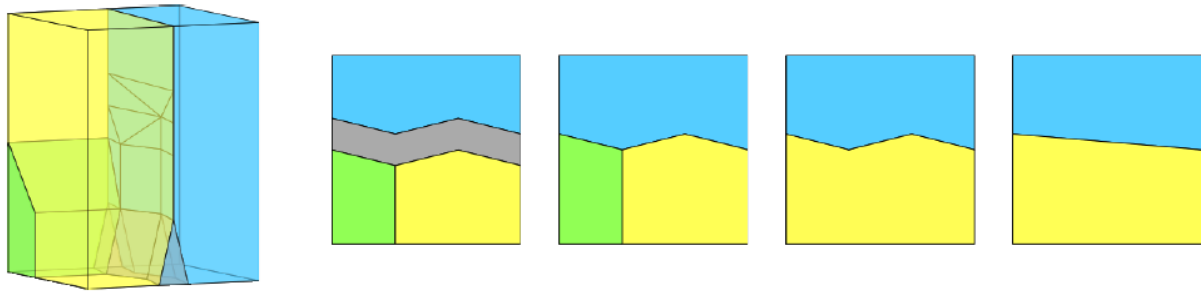


Fig. 1 Making maps as horizontal slices through the 3D SSC structure