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FCT FACULDADE DE CIÊNCIAS E TECNOLOGIA UNIVERSIDADE NOVA DE LISBOA

Departamento de Informática

Knowledge in Spatio-temporal Data

Knowledge and Information Systems Group

CENTRIA

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Objectives

Nowadays, organizations are collecting and storing huge amounts of data, at fine resolutions, which are referenced in time and space. Some examples are: (*i*) on Twitter millions of tweets are posted everyday (see Fig. 1); (*ii*) marine traffic (see Fig. 3). The richness of these data gives us great opportunities to understand the temporal dynamic of events or to investigate the behavior of moving entities.

The goal of this work is to overcome the information overload by providing the user with relevant changes that gives an understandable high-level overview of a phenomenon (or activity).

Fig. 1 - Tweets locations along five hours

Methodology

Looking at the Geovisual Analytics area, the huge volume of spatio-temporal data is handled taking an analysis mode known as the VA Mantra: "*Analyze first, show the important, zoom, filter and analyze further, details on demand*". Based on VA Mantra, a model is proposed (see Fig. 2) which focus its Knowledge Discovery activity (*analyze first*) on the detection of relevant changes to the user.

The relevant changes detection is intended to be supported by a hierarchical representation of the phenomenon/activity, i.e. data reduction through systematic less detailed representations, in order to efficiently deal with vast amount of data.

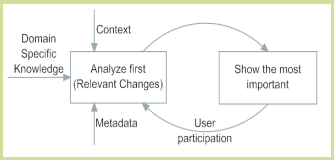

Fig. 2 - Proposed Model

Expected Results

The expected results from this PhD program are:

- A hierarchical granule-based model which provide less detailed representations for different kinds of spatio-temporal data (e.g., events, moving objects).
- A relevant change modeled concept.
- A framework able to extract relevant changes.
- A prototype incorporating the previous contributions, capable to deal with different datasets.

Fig. 3 – Marine Traffic

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