Title: *Using Information Visualization Analytics to evaluate Contemporaneous data from different countries*

Scope:

Visual analytics is the science of analytical reasoning facilitated by interactive visual interfaces. People use visual analytics tools and techniques to synthesize information and derive insight from massive, dynamic, ambiguous, and often conflicting data; detect the expected and discover the unexpected; provide timely, defensible, and understandable.

Visual analytics is a multidisciplinary field that includes the following focus areas:

- Analytical reasoning techniques that enable users to obtain deep insights that directly support assessment, planning, and decision making
- Visual representations and interaction techniques that take advantage of the human eye's broad bandwidth pathway into the mind to allow users to see, explore, and understand large amounts of information at once
- Data representations and transformations that convert all types of conflicting and dynamic data in ways that support visualization and analysis
- Techniques to support production, presentation, and dissemination of the results of an analysis to communicate information in the appropriate context to a variety of audiences.

Nowadays, there are several websites where public data is available. Many of these websites contain thousands of statistics and indicators on various aspects of the reality of a country. There are several ways to search for desired information. These portals normally also allow the performing of advanced queries, including through the selection of time intervals or specific years. Some of them even allow calculations and create new indicators. Although these websites contain very interesting and rich information about the reality of a country in several categories, the information is always presented in a tabular format (numbers and text) or some very simple graphic representations. It would be highly valuable to develop visualization models supported by communicational narratives that are capable of representing the data, promote the discovery of new insights, highlight trends, and new relations.

The main goal of this project will be to develop a visualization analytics model that will help to achieve this. The model should be abstract enough and hold different visual approaches (combining both existing visual techniques and possibly new ones) allowing/helping the extrapolation of patterns or new information from the existing one, identifying trends or data gaps, for instance. An important aspect the work should focus on developing creative visualization concepts supporting user's ability to grasp the data, study the most effective way to communicate and interact with the

information, supporting techniques to create narratives that are backed up by the data. This is an important metric of quality of the model to be developed and will allow for the assessment of the models developed with previous work.

See for example the following videos illustrating this concept:

"Create or Else: IBM Art of Data" http://www.youtube.com/watch?v=PnpGIgzNBJo

Hans Rosling TED talk: Debunking third-world myths with the best stats you've ever seen, on using data visualization comparing different country statistics: http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen.html

Supervisors:

- Prof. Dra. Elizabeth S. Carvalho, UM, Algoritmi Center and/or Department of Systems Information, ecarvalho@ccg.pt
- Prof. Dr. Pedro Branco, UM, DSI, pbranco@dsi.uminho.pt