

CORDI/S PhD project proposal

INRIA team: GRAVITÉ

Author of the proposal: Guy Melançon

Title of the proposal: Visualizing evolving multimedia databases

Keywords (max 5-6): interactive visual graph mining, web communities, web 2.0

Scientific context (10-15 lines): Nowadays, the web acts as a mirror of society with constantly evolving content. The web 2.0 revolution focuses on collaborative processes, from content creation and dissemination, cultural events of all forms, as well as communities of interest. The May 2001 directive 2001/29/EC of the European Parliament on the harmonisation of copyright and related rights in the information society transferred in France into a shared mission involving both the Bibliothèque Nationale de France (BNF) and the Institut National de l'Audio-visuel (INA) to archive web documents.

INA is in charge of collecting all multimedia services and resources (originating from France), thus requiring the design and development of content analysis tools to ease the access to archived material. Based on various classification criteria and content similarity measures, INA intends to develop tools to navigate dynamically changing multimedia content based on relevant visual metaphors.

Goal (10-15 lines): Information Visualization can be described as the process of mapping non spatial data into relevant visual forms to support analytical reasoning. The goal is to provide the user with a readable and coherent visual representation of the data, equipped with relevant interactions, which becomes a real challenge when dealing with data dynamically evolving with time.

The data we face within the INA context can be handled from different perspectives and implicitly share numerous relations that must be explored. We plan to tackle this problem by addressing it as a graph visualization problem. The huge volume of data together with their temporal aspect adds to the problem we need to solve. Although the drawing of graphs has been extensively studied, the visualization of dynamic graphs still remains largely unexplored.

Project (10-15 lines): The INA data presents numerous facets, thus allowing the definition of several visualization options and scenarios we need to specify according to potential usage and objects characteristics. We plan to look into several directions:

- using multi-level graph representation to downsize the data and offer optimal readability;
- decide on drawing procedures taking the user's mental map into account, maintaining it at all time when dealing with time stamped data;
- define several "points of view" on a same dataset, extending the notion of focus + context visualization.

Skills. Graph (data) mining; graph drawing and visualisation; human-computer interaction; certified skills developing with C++. Prior knowledge of Tulip is a plus.

Advisors: David Auber, Guy Melançon

The PhD fellow will have to work in both the INA and LaBRI/INRIA context. Industrial partner : Marie-Luce Viaud, INA, 4 avenue de l'Europe, 94360 Bry sur Marne

References (max 5):