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Habilitation en Informatique – Date : 25.02.2019

Titre et résumé de la thèse – Title and abstract of the thesis

Dynamic Profiles Creation for Voting Advice Applications - An Implementation for the 2017 Ecuador National Elections

Electronic participation (eParticipation) has been addressed more often in academia and is an emerging and growing research area that makes use of internet solutions to enhance citizens' participation, providing a fair and efficient society with the use of cutting-edge technology. Social networks and online communities have become an important environment for exchanging information about products, services, music, and movies, among others. Recommender systems (RSs) are computer-based techniques used in an attempt to present information about products that are likely to be of interest to a user. Other applications make use of RSs, such as social networks and communitybuilding processes, among others.

In an information and knowledge society, such technologies could also improve democratic processes, increase citizens' interest in political issues, enhance participation, and renew civic engagement. However, the difficulty of finding other citizens or groups that share common interests is still a barrier to overcome. Informed citizens are one of the key elements of a representative democracy.

The availability of reliable information has dramatically changed over time, posing major challenges to citizens who desire to make informed decisions. Just a few years ago, for example, the main informationrelated obstacle was the scarcity of information. People either watched TV news or read newspapers. Discussions of topics were minimal among friends, colleagues, or family members. Over time, however, the rise and spread of the internet has caused the scarcity problem to turn into a problem of abundant information. Citizens now face an enormous amount of information that cannot be processed easily.

The sources are unlimited, making it very difficult to find reliable information. In this context, the Participa Inteligente platform was developed — under the leadership of the Dr. Luis Terán, principal investigator, in cooperation with academics from different universities in Europe and Latin America — to collect data from users, apply new methods and algorithms, and evaluate usability and impact. Participa Inteligente is a social network designed for the 2017 Ecuador national elections to prove the concepts and methods developed, which include a number of tools such as RSs, a voting advice application (VAA), community fact-checks, and visualizations, among others, for different purposes. These tools were intended to allow citizens to generate spaces for discussion and participation in topics of interest in society.

The expectation is that this project will impact citizen decision-making, first of all, by providing users with relevant information and resources to debate and think over their choices and then make better decisions. Secondly, it is expected to impact government actions through informed knowledge and feedback from societies, all of this with the idea of strengthening democracy using new technologies. Furthermore, the project is expected to extend its use in other contexts and regions within the coming years.

Titre et résumé de la leçon d'essai – Title and abstract of the inaugural lecture

Collaborative Filtering and Matrix Factorization for Recommender Systems

Recommender systems (RSs) are computer-based techniques that attempt to present information about products that are likely to be of interest to a user. These techniques are mainly used in electronic commerce in order to provide suggestions on items that a customer is, presumably, going to like. Nevertheless, there are other applications that make use of RSs, such as social networks and community-building processes, among others.

A recommender system is a specific type of information filtering technique that tries to present users with information about items (e.g., movies, music, books, and news, among others) in which they are interested. The term "item" is used to denote what the system recommends to users. To achieve this goal, the user profile is contrasted with the characteristics of the items. These features may come from the item content (content-based approach) or the user's social environment (collaborative filtering). The use of these systems is becoming increasingly popular on the Internet since they are very useful to evaluate and filter the vast amount of information available on the Web in order to assist users in their search processes and retrieval. RSs have been highly used and play an important role in different Internet sites that offer products and services in social networks, such as Amazon, YouTube, Netflix, Yahoo!, TripAdvisor, Facebook, and Twitter, among others. Many different companies are developing RSs techniques as an added value to the services they provide to their subscribers.