

ONLINE SOCIAL NETWORKS AND SOCIAL NETWORKS RESEARCH CHALLENGES

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Abstract

Social Networks have undergone a dramatic growth in recent years. Such networks provide an extremely suitable space to instantly share multimedia information between individuals and their neighbors in the social graph. Social networks provide a powerful reflection of the structure and dynamics of the society of the

21st century and the interaction of the Internet generation with both technology and other people. Indeed, the dramatic growth of social multimedia and user generated content is revolutionizing all phases of the content value chain including production, processing, distribution and consumption. It also originated and brought to the multimedia sector a new underestimated and now critical aspect of science and technology: social interaction and networking. The importance of this new rapidly evolving research field is clearly evidenced by the many associated emerging technologies and applications including online content sharing services and communities, multimedia communication over the Internet, social multimedia search, interactive services and entertainment, health care and security applications. It has generated a new research area called social multimedia Computing, in which well established computing and multimedia networking technologies are brought together with emerging social media research.

Introduction

The emergence and popularity of online social networks in recent years has changed the Internet ecosystem leading to a more collaborative environment. Nowadays, hundreds of millions of Internet users participate in social networks, form communities, produce and consume media content in revolutionary ways.

There are very successful EU online Social Networks that account for more than 200 Mio registered users. They would benefit from working together with other relevant EU players to increase their own competitiveness and the competitiveness of the whole EU economy. A partnership among EU partners successfully active on the web (e.g. social networks, gaming, broadcasters, ICT users, incumbent ICT industry and academia) would certainly contribute to increase the competitiveness of EU industry on the web. The partnership would design measures (research, skills, regulatory, access to capital, etc.) to overcome the bottlenecks in order to increase the competitiveness of EU industry on the web.

Social Networks have undergone a dramatic growth in recent years. Such networks provide an extremely suitable space to instantly share multimedia information between individuals and their neighbors in the social graph. Social networks provide a powerful reflection of the structure and dynamics of the society of the

21st century and the interaction of the Internet generation with both technology and other people. Indeed, the dramatic growth of social multimedia and user generated content is revolutionizing all phases of the content value chain including production, processing, distribution and consumption. It also originated and brought to the multimedia sector a new underestimated and now critical aspect of science and technology: social interaction and networking. The importance of this new rapidly evolving research field is clearly evidenced by the many associated emerging technologies and applications including online content sharing services and communities, multimedia communication over the Internet, social multimedia search, interactive services and entertainment, health care and security applications. It has generated a new research area called social multimedia Computing, in which well established computing and multimedia networking technologies are brought together with emerging social media research.

Social Networking Internet services are changing the way we communicate with others, entertain and actually live. Social Networking is one of the primary reasons that many people have become avid Internet users; people who until the emergence of social networks could not find interests in the web. This is a very robust indicator of what is really happening online. The Web 2.0 era passed leaving behind great strength to the end-users.

Nowadays, users (also known as prosumers¹), both produce and consume significant quantities of multimedia Content. Moreover, their behavior when combined with Social Networking (i.e. communication between users through online communities) has formed a new Internet era where multimedia content sharing through Social Networking Sites (SNSs) is an everyday practice. More than 200 SNSs of worldwide impact are known today and this number is growing quickly. Many of the existing top web sites are either pure SNSs or offer some social networking capabilities.

Except for the well known “first tier” social networks with hundreds of millions of users that span in the entire world, there are also many smaller social networking sites that are equally as popular within the more limited geographical scope of their membership, within a city, country or continent, for example. There are also many vertically oriented communities that gather users around a specific topic and thus, they have many dedicated members.

Socialization

The lifelong process of social interaction through which individuals acquire a self identity and the physical, mental, and social skills needed for survival in society

Socialization is the essential link between the individual and society

Why socialization is important

1. Teaches us ways to think, talk and act that are necessary for social living
2. Ensures that members of society are socialized to support the existing social structure.
3. Allows society to pass culture on to the next generation

Human Development

Each of us is a product of two forces:

1. Heredity- “nature”
2. The social environment -“nurture.”

Biology dictates our physical makeup

Social environment largely determines how we develop and behave

Biological traits matter to the degree that society makes them matter

Social Environment

What are the consequences to children of isolation and physical abuse, as contrasted with social interaction and affection?

Agents of Socialization

Family

Socialization through families enables society to “reproduce” itself

Functionalist Perspective on Schools

1. Teach students to be productive members of society
2. Transmit culture
3. Social control and personal development
4. Select, train, and place individuals on different rungs in society

Conflict Perspective on Schools

1. Experiences depend on social class, racial–ethnic background, gender, and other factors
2. Children learn to be neat, punctual, quiet, wait their turn, and remain attentive to their work
3. Schools socialize children for later roles in the work force

Peer Groups

1. A group of people who are linked by common interests, equal social position, and age
2. Contribute to our sense of “belonging” and our feelings of self-worth
3. Provide children with an opportunity for successful adaptation to situations such as gaining access to ongoing play, protecting shared activities

Media as Socializing Agents

1. Inform us about events
2. Introduce us to a variety of people
3. Provide an array of viewpoints on current issues
4. Make us aware of products that will supposedly help us
5. Entertain us

Gender Socialization

1. The aspect of socialization that contains specific messages and practices concerning the nature of being female or male in a specific group or society
2. Important in influencing our beliefs about acceptable behaviors for males and females

Racial Socialization

1. The aspect of socialization that contains specific messages and practices concerning the nature of one's racial or ethnic status as it relates to:
2. Personal and group identity
3. Intergroup and inter individual relationships
4. Position in the social hierarchy

Socialization is a lifelong process

1. Each time we experience a change in status (becoming a college student or getting married), we learn a new set of rules, roles, and relationships
2. Before we achieve a new status, we often participate in anticipatory socialization, the process by which knowledge and skills are learned for future roles

Rite of Passage

An important rite of passage for many Latinas is the quinceañera—a celebration of their 15th birthday and their passage into womanhood

Occupational Socialization

Sociologist Wilbert Moore divided occupational socialization into four phases:

1. Career choice
2. Anticipatory socialization (learning aspects of the occupation before entering it)
3. Conditioning and commitment (learning the occupation and committing to it)
4. Continuous commitment (remaining committed even when problems arise)

Re-socialization

1. Learning a new set of attitudes, values, and behaviors
2. Re-socialization is voluntary when we assume a new status of our own free will
3. Involuntary re-socialization occurs against a person's wishes and generally takes place within a total institution
4. Total Institution: Erving Goffman's term for a place where people are isolated from the rest of society for a set period of time and come under the control of the officials who run the institution

Re-socialization and the Military

People in military training are re-socialized through extensive, grueling military drills and maneuvers

Micro blogging

Micro blogging websites are services, which enable their users to post small text messages that will update their personal profile and will also be delivered to their list of friends. Micro blogging became extremely popular due to twitter, however other micro blogging sites exist as well with similar functionalities. Twitter currently has approximately 190 million users and growing. After its extreme popularity and due to its flexibility and integration in several platforms (mobile phones, desktop apps, email alerts etc.) marketing experts invented a

new tool for fast and targeted advertising. The e statistics provided from pear Analytis 32 study reveal that almost 44% of the posts are spam and pointless, about 6% are personal or product advertising, while 3.6% are news and 37.6% are conversational posts. However, there are many other micro blogging services available. Tumblr³³ provides similar functionalities, however more focus on the design and styling is given. A more flexible micro blogging solution is posterous³⁴ that provides a unique way to post small messages to various destinations. Posterous enables a user to connect his/her social networking accounts to the posterous platform and to deliver the posts also to other social networking sites or email addresses of choice. One very powerful feature that is relatively new for micro blogging as well as for the social networking platforms is the ability for the user to post a message only to a selected group of friends or other recipients and not necessarily for the whole list of friends. A new mobile service that extends this feature and works on the boundaries of micro blogging is GroupMe³⁵. Users of Group Me compile groups of their contacts and use a new unique telephone number to reach the group.

Social media search and management in large scale**Social media search**

Since the domination of social networking sites as the primary channel of communicating ideas and sharing media, new social search engines emerged. However, these search engines crawl the social networks and index the available content based only on text. Some of these keyword-based social search engines are: Spy⁴², SamePoint⁴³, SocialMention⁴⁴, WhosTalkin⁴⁵, wikio.com.⁴⁶

Spy is a web application that is updated in real time and provides the user with the ability to watch what is being said in a certain topic in specific social networking sites and blogs. Same-Point provides an easy interface for the user to select in which of the social networks to search for a keyword or topic. Social Mention works like Google alerts⁴⁷ but for social media. Whos-Talkin is a social media search tool that allows users to search for conversations surrounding the topics that they care about the most. Wikio is a personalisable news page featuring a news search engine that searches media sites, blogs and the contributions of Wikio members.

Content management in large scale

In the scale that most of the prime social networks operate, even the most common operations are not trivial. The most powerful example is Face book that has to handle almost 500 Million active users that share more that 3

billion photos per month and its servers should serve about 1.2 million photos per second⁴⁸. For such volumes of content management becomes a very crucial issue. Here we refer to some technologies and tools that most of the social networks use in order to survive the torrents of queries.

Social Analytic tools

The technique of data analysis of the communications in social communications (often referred to as the “social graph”) is an extremely powerful tool for business. For example, analysis of relations and communications between members of a group or a community can show which the most important ones are (socially). This information can be vital when a viral marketing plan is being formulated or when a loyalty scheme is going to be implanted amongst a company's customers. A great market has been opened to both the clients of the data analysis and to the researchers and developers of new solutions for the data analysis. Argyle Social⁷⁶, Trackur⁷⁷ and Radian⁶⁷⁸ are some of the examples of commercial tools which are used to analyze the data coming from social networks, profile the users and personalize the marketing strategies.

Social Networks -Research Challenges

This section presents selected open research challenges that are currently being investigated by the research community. The authors would like to make clear that these are only few of the dozens of research challenges that the research community faces towards the quest for a ubiquitous, intuitive and secure social web.

Social Networks –

Re Avoiding fragmentation of the social graph through open cross-platform interactions

A major hindrance to exploitation of social network data is the fragmentation of the population of social network users into numerous proprietary and closed social networks. This issue is compounded by the fact that each new game or media application tends to build its own social network around it rather than building upon the rich data available about existing social relationships. Also applications are often restricted to execute within the confines of specific social network platform. A major research challenge, therefore, that would benefit the exploitation of social network graphs for future media networking, is in finding solutions to open up social network platforms to allow cross-platform information exchange and usage. Of course, reliable mechanisms to preserve privacy are an essential prerequisite.

Communities' discovery and analysis in large scale online and offline social networks

As social networks will continue to evolve, discovering communities and constructing specific social graphs from large scale social networks will continue to be a dynamic research challenge.

Security by means of Social Networks Analysis

The information extracted from Social Networks proved to be a useful tool towards security. One example of an application related to security is the Analysis of terrorism, as for instance, the Analysis of the 9-11 Terrorist Network. This study was done by gathering public information from major newspapers on the WWW and analyzed it by means of Social networks. A major research challenge on social network analysis is also cyber surveillance for unlawful activities for critical infrastructure protection.

Social and Ethical Issues in a Networked World

As in every small or large community, online social communities face also critical social and ethical issues that need special care and delicate handling. Sharing of personal information, protection of child exploitation and many other problems have to be studied and answered appropriately.

Searching blogs, tweets, and other social media

Searching in blogs, tweets and other social media is still an open issue since posts are very small in size but frequent, with little contextual information and sometimes extremely temporal. Moreover, different users have

different needs when it comes to the consumption of social media. Real time search has to balance between quality, authority, relevance and timeliness of the content.

Search Challenges

Human-powered community question answering and expert finding.

Human powered (aka crowd sourcing) systems gave promising solutions to problems that were unsolved for years. The research community should continue working on leveraging human intelligence to solve critical problems and answer questions that otherwise would be impossible to answer automatically.

Social networks contain immense knowledge through their users. However, it is not trivial to find the one that has the knowledge and is also available to share it

Traffic prediction for dimensioning media applications

Investigation of how to exploit knowledge of social network relationships to predict how media consumption may be correlated between groups of users. This information can be used to dimension media servers and network resources to avoid congestion and improve QoE.

Social, mobile, pervasive content sharing and live media distribution

Since users act as prosumers, content sharing and distribution needs will continue to increase. Mobile phones, digital cameras and other pervasive devices produce huge amounts of data that users want to distribute if possible in real time .

Spam, opinions and adversarial interactions in social media

Spam detection and advertisement detection are research challenges that need extra attention from the research community. Since users and data production increase, spam (irrelevant in-formation) and advertisements will continue growing.

In addition, the importance of social networks to influence the opinions of the users should be protected with the adequate mechanism to avoid biased and fake opinions due to the relevance to the businesses.

Personalization for social interaction

In order to improve social interaction and enhance social inclusion, personalization engines that locate peers with possibly common likes, dislikes or developing trends should be engineered. Towards more efficient search engines that will be able to serve the users only with relevant content, personalization algorithms have to be Studied in a greater extent.

Dynamics and evolution patterns of social networks, trend prediction

Research in dynamics and trends in social networks will provide more valuable tools for information extraction that may be used for content management and delivery, epidemic predictions or recommender systems.

Information diffusion in Social Networks

Research in Information diffusion is more than ever needed since the domination of social networks as a communication platform.

Use of Social Networks for business and marketing

Social networking introduced novel collaboration paradigms between network users and serious study is conducted on the use of such platforms for internal business purposes. However, one of most prominent

research challenges is how to use social networking for external communications, customer support and of Course targeted marketing.

Social gaming and social television

Research is needed on better mass feedback mechanisms for both social gaming and social television. For social gaming as “serious game” is a research challenge.

Immersive Social Networks

Immersive social networks will be the future web platforms for social interaction, communication and infotainment. Immersion will provide an intuitive environment and enhance user experience in order to let the users socialize and interact in a more natural way.

The goal of this publication is to provide an initial base line to build a discussion forum on the most critical issues related to social networks. The outcomes of these discussions could feed into the research agendas of the European Union programmers for the near future.

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