

## Chapter 26

# Privacy Preservation of Social Media Services: Graph Prospective of Social Media

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### ABSTRACT

*Social media has revolutionized the way of communication and interaction in daily life. It provides an effortless, expeditious and reliable approach for communicating with family, friends, and others. With the stupendous popularity of social media, users and their information over the social networking sites has also increased and accumulated the unprecedented amount of user's information. These tremendous data attract sniffer to perform attack and breach the privacy. Social networking sites provide their data for research and analysis purpose in anonymized format. But still with certain means, if a victim has an identical sub-network and the attacker has some background knowledge of the victim then the attacker can re-identify the victim by performing structural based attack such as degree based attack, neighborhood attack, sub graph attack, etc. This chapter provides a bird eye over Social Media, social media services, privacy preservation over social media, and social media attack with their graph prospective.*

### INTRODUCTION

In the era of Web 2.0, User-contributed data on the internet has been growing exponentially. Social Media podiums as well as commercial website, such as Facebook, Twitter, Yahoo, LinkedIn, Amazon, Yatra.com etc. provide a platform to share their experiences and opinions on Election, economics decision, politics, products quality, and globally-critical issue. Social media has revolutionized the way of communication and interaction in daily life and provides an effortless, expeditious and reliable approach for communicating with family, friends, and others without any timelines and geographical boundar-

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ies. Social Media is the use of electronics and Internet tools for the purpose of sharing and discussing information with other human beings in more convenient way. It also provides a platform to observe human behavior with a new glass in an exceptional way.

People use social networking sites (SNS) for communicating and sharing information with their friends. And find people those have same interest or issues in political view, economics, music, sports and technical area. If users can post and share information publicly on social networking sites then these social networks are defined as social media. Users can create their groups and communities with friends or others. And post, upload or share the information on social media in these groups and communities. On social media, users may post a status about their feeling, political views, news feeds and also upload or share images and videos.

To use SNS services, users need to create a profile and provide their valid and real information. SNS encompasses unprecedented amount of user personal and public information sources form user's profile and user generated data from their activity on social media (M. Fire, R. Goldschmidt, Y. Elovici, 2014). For example Facebook has over 1.65 billion monthly and 1.09 billion daily active users (Company Info | Facebook Newsroom, 2016). This sensitive and tremendous data, attract the sniffer to perform attack over social network to breach the privacy of data.

As the social media popularity has increased, interest in social networks user data is also gaining more attraction. Social networking sites provides there data to third party consumers such as epidemiologists (e.g., to understand infectious disease dynamics) (Yang Wang, 2003; N. Li, 2013), sociologists, (e.g., for studying social structure) (M. Granovetter, 2005, pp 33-50), businesses (e.g., to drive marketing campaigns and to enable better social targeting of advertisements) (P. Klerks, 2003, pp 97-113) and criminologists (e.g., identifying insurgent networks and determining leaders and active cells) (S. Ji, W. Li, M. Srivatsa, J. S. He, and R. Beyah, 2014).

The social networks data have private and sensitive information of the end users. It is necessary to ensure that published social network data would not breach the privacy of a single end users (M.I.H. Ninggal, 2014; J. Williams, 2010; T-S. Hsu, 2014). In order to maintain the privacy SNS release sanitized version of social network data know as anonymized social network data. In anonymized format, anonymity notation is used for data that prevents the re-identification of individuals by an attacker.

The main objective of this chapter is to give an introduction over growing and promising field called Social media and attack over it. The material in this chapter is presented from a graph perspective and emphasizes on graphical representation of social media data set, privacy preserving, anonymization of social network data set and demonstration of various attacks over social media.

## **SOCIAL MEDIA BENEFIT**

Social media is an online electronic communication that allow users to communicate, create online communities to share information, new ideas, messages, and other personal and public content (Merriam-Webster, 2015). Marketing companies may advertise their products on social media and gain more popularity among people in short time. Social media has benefits of instant messaging, information sharing, and post comments for the users.

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