Using Social Networks to Solve Crimes: A Case Study

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ABSTRACT

In this paper, the author investigates the use of the popular Social Networking Site (SNS) Facebook to solve crimes. In particular, the author uses car thefts as a case study. When a car owner discovers that his or her vehicle has been stolen, every means helps to recover the vehicle. Reporting the incident immediately to the police is obligatory, but alerting his or her network of friends on a social networking site about the misfortune could prove useful. In particular, the authors look into a real case study. This report answers several questions, such as: How useful can these sites be to help an owner recover the vehicle? How far can an appeal reach? What type of feedback do users send? The author analyzes how people create the appeal in Facebook and what information is shared.

Keywords: Crime, Information Theory, Networks, Propagation, Social Networking

INTRODUCTION

The social networking site Facebook started as a college oriented social networking platform in 2004 and was founded by a Harvard University undergraduate student Mark Zuckerberg. Facebook helps people communicate with their friends, family and co-workers. The company develops technologies that facilitate the sharing of information through the social graph, the digital mapping of people’s real-world social connections. By giving the Facebook application programming interface (API) to developers, the platform stimulates the development of Facebook specific applications and data exchange with other online services. To use most of the features, users must create a Facebook account and they must be logged-in to Facebook. Facebook provides users with privacy control over their profile, allowing profile information to be classified as either private, visible only to their friends, or, the default, public (“Facebook Press”, 2012).

FACEBOOK STATISTICS (“FACEBOOK FACTSHEET”, 2012)

- More than 800 million active users (users who have returned to the site in the last 30 days);
- More than 50% of our active users log on to Facebook in any given day;
• Average user has 130 friends;
• More than 900 million objects that people interact with (pages, groups, events and community pages);
• Average user is connected to 80 community pages, groups and events. On average, more than 250 million photos are uploaded per day.

According to Gross and Acquisti (2005) a reason which might shed light on the exponential growth of these particular social networking sites is “college-oriented social networking sites provide opportunities to combine online and face-to-face interactions within an ostensibly bounded domain” (Gross & Acquisti, 2005).

Our findings are in conflict with the common perception that information spreads widely and quickly across Facebook. Our observations about some of the existent groups may be related to the burnout process in the theory of information diffusion (Rogers, 2003). The slow pace of information propagation might reflect the challenges in recovering the stolen vehicle, even if information is exposed to immediate friends. This is because propagation of information in social networking sites is very abstract. In fact, propagation through SNRs has been studied and mapped onto different propagation models, mostly viral propagation in computer networks. Mapping of propagation can be studied against propagation in computer viruses an Internet surfing habits. These studies proved well when considering specific assumptions, but cannot be used as a general model for propagations through computer networks. The scope of our work is not to explain and go into different propagation techniques but to show how previous studies in different fields provide insight on the propagation paths of information in social networking sites. Instead of listing similarities in different concepts such as viral or propagation, we focused on the differences that appear between them in order not to generate confusion.

As mentioned before, most propagation studies are based on and related to the epidemiological studies. Mathematical models developed to model propagation of infectious diseases have been adapted to model propagation of computer worms. In the epidemiology area, both deterministic and stochastic models exist for modeling the spreading of infectious diseases. In network security area, both deterministic and stochastic models of active worms based on their respective counterpart in epidemiology area have emerged (Rushkof, 1994). In Epidemiology, the spread of viruses and other pathogens have been studied. Research models based on the same rate of possible contacts are used in different fields and have been used for a long time producing a general good result when assuming that for everyday experience, random contacts gave good results. In our case, recurrent contact is made between fixed number of users and some contacts are more prone to infection than others. This makes it more challenging mapping the social network propagation to epidemiological propagation since only certain aspects can be mapped, and can only be done studying and mapping on what is considered relevant from different point of views. The major differences in both fields can be grouped in two major areas being differences in available data and in the format of the network nodes.

A meaningful connection in social networks such as Facebook is solved by the sociotechnical environment of the sites itself. In the boyd-Ellison article about Social Network definition and scholarship (boyd & Ellison, 2007): a SNS is defined by its power of articulating a set of connections between users. A connection between users is explicitly established by the users themselves, by friending, commenting and sharing, which make up a meaningful link between users. Thus, this does not mean that every connection has the same value to the user. Differences between values of connections occur because friendship on Facebook is different from reality, where online users befriend each other even though they do not know each other in real life; hence the social connection level is in the technical structure of the system itself.

The other difference when comparing to epidemiology propagation is about the nature
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