Chapter 18
Automatic Detection of Cyberbullying to Make Internet a Safer Environment

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ABSTRACT

The Internet has become an inevitable form of communication, which enables connections with colleagues, friends, or people with similar interests, regardless of physical barriers. However, there is also a dark side to the Internet, since an alarming number of adolescents admit they have been victims or bystanders of cyberbullying. In order to make the Internet a safer environment, it is necessary to develop novel methods and software capable of preventing and managing cyberbullying. This chapter reviews existing research in dealing with this phenomenon and discusses current and potential applications of text mining techniques for the detection of cyberbullying.

INTRODUCTION

Cyberbullying has become an urgent problem during recent years, especially after several dramatic events, such as suicides. According to the definition of the National Crime Prevention Council, cyberbullying is the use of the Internet, cell phones or other technologies to send or post a text or images intended to hurt or embarrass another person (NCPC, 2006). Cyberbullying can be carried out through several technology platforms, such as chat rooms, emails, photo sharing websites, blogs, forums, social networking cites, cell phones, online games and voice mail.

Since cyberbullying has a major impact on society, especially on its sensitive part, such as teenagers in their formative years, it has become an intensive field of research. Although many researchers analyse the causes and consequences of cyberbullying, only a few of them suggest methods for its prevention. This article reviews the concepts of possible proposals on how the Internet may be made a safer environment, by using text mining techniques for detecting and tracking cyberbullying. If the problem of cyberbullying can be solved or minimized, social interaction will become safer for many users on the web, especially for those most vulnerable: teenagers. Therefore, focus on

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prevention and intervention efforts is extremely important to ensure the safer usage of cyber space.

This article focuses on the utilisation of text mining techniques for the purpose of making the Internet a safer environment. An overview of the cyberbullying problem is presented in the following section. In the third section text mining techniques are explained briefly, and the forth section presents existing research efforts in cyberbullying detection by using the text mining techniques presented. The conclusion summarizes the specifics and efficiency of the proposed methods, and suggests possible paths for the future improvement of software which supports various technology platforms for communication.

BACKGROUND

Bullying is not a new phenomenon, since it has existed since ancient times. However, it has acquired a novel dimension with the rise of a new environment – the Internet, and has developed a new form known as cyberbullying. Cyberbullying is a unique phenomenon associated with the use of electronic communication technologies, representing an instrument for threatening, embarrassing or socially excluding another person (Hinduja & Patchin, 2008). Bullying in the cyber environment is much crueller and more dangerous than "traditional" forms of bullying which take place in the real world. The reasons for that are primarily certain aspects of the web: persistence, the ability to search and copy, and invisible audiences (Boyd, 2007). Because of web persistence the victim is unable to hide anywhere, since the audience is not confined to the room, school yard or street, but a large online community.

Two basic characteristics of cyberspace are dominant for cyberbullying: anonymity in cyberspace and better control of social interaction in the cyber world (Dempsey, Sulkowski, Dempsey & Storch, 2011). Creating a new identity online is very easy, and can be done in a few minutes without the true identity being checked. The anonymity of the bully is enabled through the Internet. Most (84%) cyber bullies know the identity of their victims, while only 30% of cyber victims can identify the perpetrators (Ybarra & Mitchell, 2004). Another peculiarity of cyberbullying is better control of social interaction in the cyber world. Abusers can choose when they want to harass their victim, how (through which medium), and whether they wish to bully in front of an audience.

In addition, along with greater control of social interactions and added anonymity, some pupils who have lower levels of aggression in the physical environment may behave aggressively in cyberspace (Dempsey et al., 2011). Cyberbullying detection is exacerbated by the fact that victims do not inform their parents or officers in schools because they fear that the use of their phone (at school) or ability to use the Internet (at home) (Agatston, Kowalski & Limber, 2007) may be denied to them (Williams & Guerra, 2007). Ybarra et al. (2007) found that 64% of pupils who were victims of cyberbullying (or were cyber bullied), reported that they were also "traditionally" bullied at school.

Dempsey et al. (2011) discovered that the majority of adolescents do not want to share the potential threats with adults, regardless of whether they are naive in relation to the risks in cyberspace or intentionally engaged in risky behaviour without supervision. Hence, it would be useful to inform parents about the features of new media and encourage them to supervise the way their child uses the Internet.

The main participants in the cyberbullying process are:

- The bullies,
- The victims,
- The observers, who may be:
  - Malicious, who encourage and support the bullying, or just watch, but do not intervene and help the victim,