

Chapter 8

Conclusion and Future Directions

ABSTRACT

In this chapter, the authors summarize the research performed so far on automatic cyberbullying detection, which was the topic of this book. They summarize all chapters of the book. Next, they propose a general discussion of the potential and limitations of technology-based methods for detecting and preventing cyberbullying. They also ask what the ethical boundaries are for such technology to operate in everyday life. Should we allow constant surveillance for the sake of safety? Should we limit the technology, thus taking away its true problem-solving potential to match our freedom of speech? Or is there a third way in which both the technology is used to meet its potential, while not taking away the feeling of freedom? Let questions which arise during this last chapter become guidelines for future research on automatic detection and mitigation of cyberbullying.

SUMMARY OF PREVIOUS CHAPTERS

In Chapter 1, we presented an introduction to this book. We explained the motivations that drove us in the research and described the outline of the whole book.

In Chapter 2, we presented the background for the research described in this book. We described the problem of cyberbullying in general, with specific references to its status quo in Japan. We also described some of the

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most relevant previous research done in the field of automatic cyberbullying detection, and pointed out research gaps that we aimed to fill in by the introduction of this book.

In Chapter 3, we focused on datasets used in cyberbullying detection research. We described and compared several datasets applied in previous research and described in detail the dataset which we decided to apply in our research. We also performed an initial analysis of the dataset to find its various characteristics. We preprocessed the dataset in several ways for further use and performed affect analysis to find out whether emotion related features tend to be characteristic for cyberbullying. Based on the results of affect analysis we also performed an initial attempt to classify cyberbullying data using a simple machine learning approach, considered as one of the baselines in later chapters.

In Chapter 4, we presented a method for automatic detection of cyberbullying entries and sorting the detected entries according to their harmfulness. The method was based on a Web mining technique, in particular, on an extended SO-PMI-IR method calculating relevance of new input documents with training documents. The method used a small number of seed words from three categories to calculate semantic orientation score and then maximized the relevance of categories. The method outperformed previously proposed Web-mining-based methods in both laboratory and real world conditions. The developed system was further deployed and tested in practice. After a year of testing we noticed a major, drop (over 30 percent-points) in its performance. We hypothesized on the reasons for the drop. To regain the lost performance and sustain it in the future we proposed additional improvements including automatic acquisition and filtering of seed words. Experimentally selected optimal improvements regained large amount of the lost performance, although not all of it. This drove us to explore new methods independent of previous limitations.

In Chapter 5, we presented a novel method for automatic detection of cyberbullying, based on a combinatorial approach resembling brute force search algorithms, with application to language classification. The method automatically extracted sophisticated patterns from sentences and applied them in classification. The experiments performed on our cyberbullying dataset showed advantage of this method to previous methods, including the ones described in Chapter 4. We also discussed pros and cons of this novel method when compared to previous ones.

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