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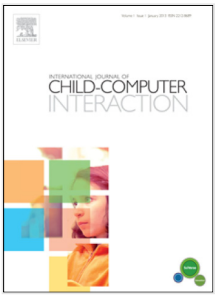

Sustainable cyberbullying detection with category-maximized relevance of harmful phrases and double-filtered automatic optimization

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Sustainable cyberbullying detection with category-maximized relevance of harmful phrases and double-filtered automatic optimization

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Abstract

We develop a supporting solution for "cyberbullying" prevention based on recent discoveries in Artificial Intelligence and Natural Language Processing. Cyberbullying, defined as using Internet to humiliate and slander other people has become a burning problem. In Japan members of Parent-Teacher Association perform manual Web monitoring to stop cyberbullying activities. Unfortunately, reading through the whole Web manually is an uphill task. Although the complexity of cyberbullying makes it a problem unsolvable solely with the help of technology, we demonstrate that technology could make cyberbullying prevention more efficient. We propose a novel method of automatic detection of cyberbullying entries on the Internet. In the method we use seed words from three categories to calculate semantic orientation score and then maximize the relevance of categories. The proposed method outperformed baseline settings in both laboratory and real world conditions. The developed system is deployed and tested in practice. After a year of testing we notice a major over 30 percent-point-drop in its performance. We hypothesize on the reasons for the drop. To regain the lost performance and retain it in the future we propose additional improvements including automatic acquisition and filtering of seed words. Experimentally selected optimal improvements regained much of the lost performance.

Keywords: Cyberbullying, Natural language processing, Semantic orientation, Optimization

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