

QUAKETEXT: MAPPING EARTHQUAKE IMPACTS FROM TEXT

Nilooofar Aflaki¹, Kristin Stock¹, Raj Prasanna², Christopher Jones³, Emma Hudson-Doyle² and Nishantha Medagoda⁴

¹Massey Geoinformatics Collaboratory, Massey University, Auckland, New Zealand

²Massey University, School of Psychology, Wellington, New Zealand

³School of Computer Science and Informatics, Cardiff University, Cardiff, United Kingdom

⁴Suncorp, New Zealand

Abstract

The rapid growth of social media has resulted in substantial disruption to society through increased online social interaction, access to participative, informal media and highly targeted advertising, among other things. However, the disruptive potential of social media for disaster response has yet to be realised. People readily describe disaster events in “real-time” on social media, including information about specific impacts such as infrastructure damage, injured people or dangerous situations, and their geographic locations, but the vast potential of this information to accelerate recovery and restoration post-event is currently lost. Furthermore, real-time access to this information with accurate georeferences (latitude and longitude) would enable better targeted earthquake response and faster recovery. Current methods are limited both in their inability to identify details of fine-grained impacts and to link those impacts to mentioned locations. The QuakeText project will develop methods to automatically extract and georeference impacts from social media. It will provide substantial scientific advances over previous work by: (1) applying the latest deep-learning methods in novel ways to extract impact details (type of impact, object affected and quantity/severity) and link them to mentioned locations, advancing on current methods that typically categorise an entire posting or fail to associate impacts with locations; and (2) developing new machine learning regression models to significantly improve accuracy over standard georeferencing methods, by interpreting complex forms of location description (e.g three houses near the cinema are on fire).

Keywords

Disaster events, Social media, Georeferencing, Text mining