Social Media and Crowdsourcing in Flood level Monitoring

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The rise in the use of mobile phone devices and social media platforms around the world has changed the way people report and respond to disasters.

In the specific case of floods, citizen reporting is invaluable for flood level monitoring. Over the last decade, community-driven initiatives have shown the efficacy of combining social media with crowdsourcing in post-flood damage assessment.

However, the huge amount of data available in social media, its low reliability, and the lack of time for the emergency responders to process it, results in a marginal use of these methodologies and data.

This research proposes a platform combining Artificial Intelligence and Crowdsourcing techniques in order to filter relevant data from social media (such as photos and videos), improve its geolocation, and aggregate the result as a map to ease the visualization of data and reduce the time needed by emergency responders to process the information.

In this platform, crawling techniques filter relevant information from the social media, which is later validated and geolocated by online volunteers. Resulting content is then processed by deep learning models in order to assess the water level in the picture. The result is a map of the affected area with geolocated social media reporting of the incident validated by the crowd and automated flood level depiction.

Preliminary results from UK Floods 2014 shows that the combination of Artificial Intelligence and Crowdsourcing allow to process huge amount of information coming from unconventional data sources such as flickr, twitter, and YouTube, and provide high quality reliable data for emergency responders in case of floods. In addition, this data could help as an added value in predicting and monitoring flood level especially during the initial hours of information black-out / early hours of the onset of the disaster, when the responders are in need of any first-hand information from the ground.