Interactive Visualization for Earthquake Analytics from Social Media Data

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Abstract

This work introduces EQSA, an interactive exploratory tool for earthquake situational analytics using social media. EQSA is designed to support users to characterize the condition across the area around the earthquake zone, regarding related events, resources to be allocated, and responses from the community.

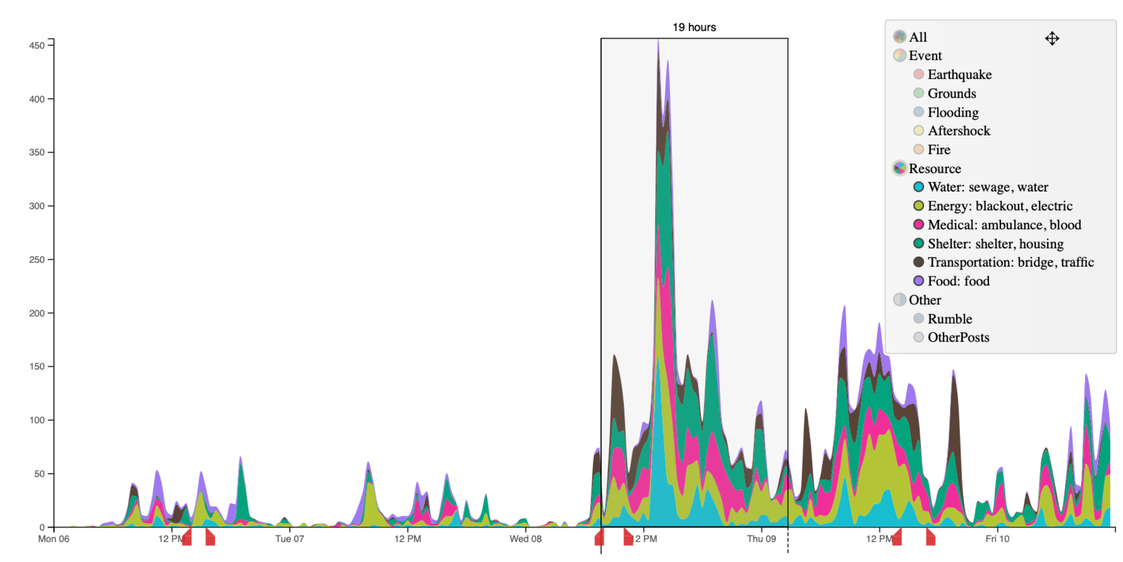
On the general level, changes in the volume of messages from chosen categories are presented, assisting users in conveying a general idea of the condition. More in-depth analysis is provided with topic evolution, community visualization, and location representation.

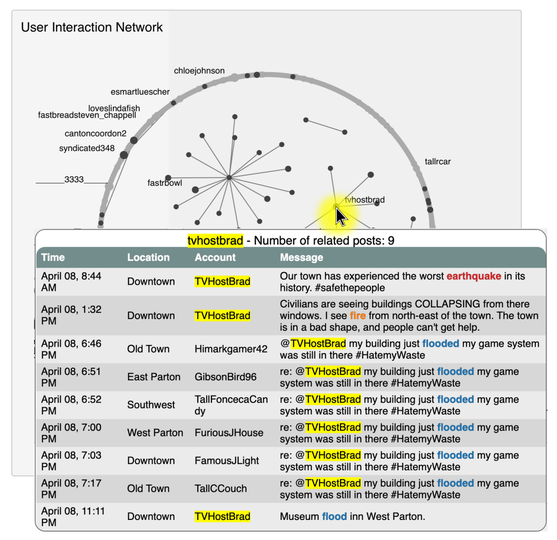
EQSA is developed with intuitive, interactive features and multiple linked views, visualizing social media data, and supporting users to gain a comprehensive insight into the situation. In this work, we present the application of EQSA with the VAST Challenge 2019: Mini-Challenge 3 (MC3) dataset.

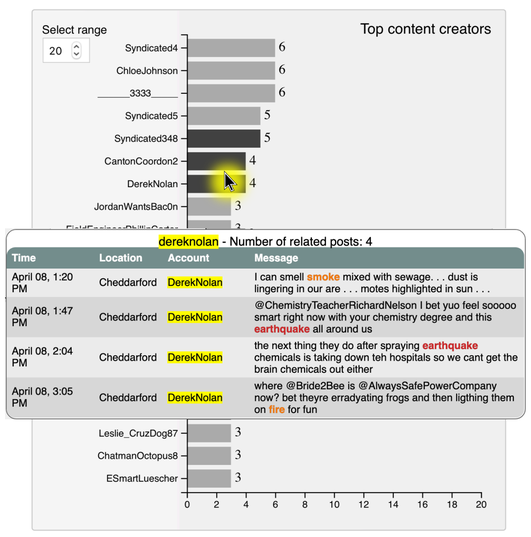
System Model

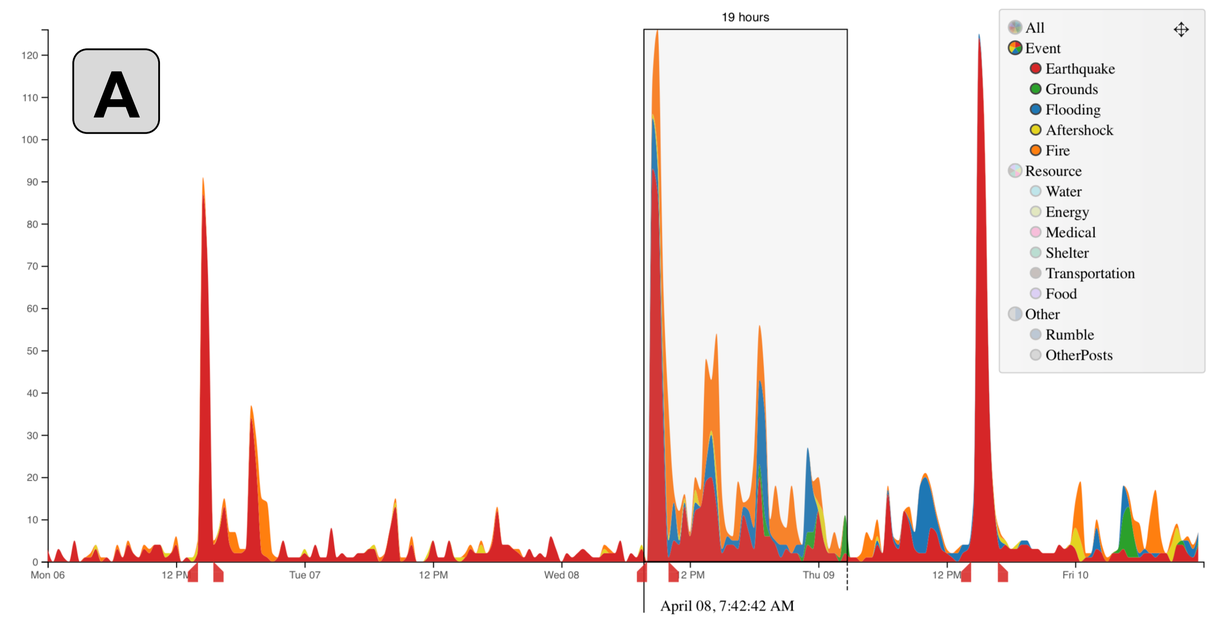
The main control panel (A) is built as a stacked area chart, showing the volume of messages according to chosen categories from selection panel. For the chosen time frame and the chosen categories: Panel (B) presents WordStream [1] for topic evolution, panel (C) is a map in which each neighborhood's color indicates the number of posts, panel (D) is a network user interaction and panel (E) is a chart for ranking content creators. Detail-on-demand and interactive features are also added in EQSA [2] to support the analysis such as sliding window with adjustable window size for updating the system and specific messages on mouse-over events.

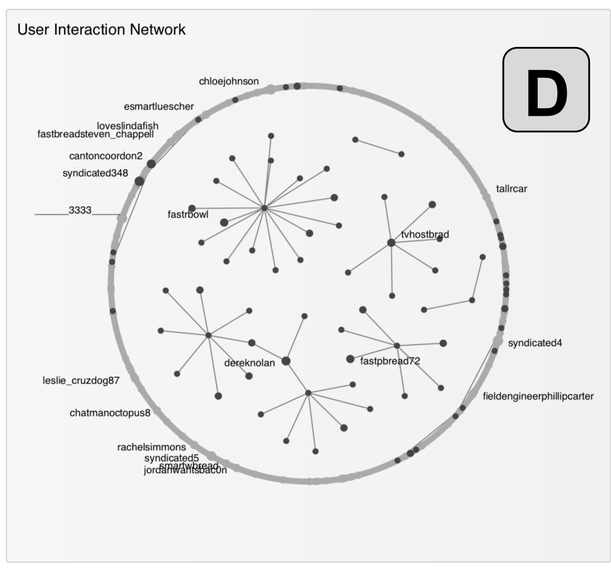
System View

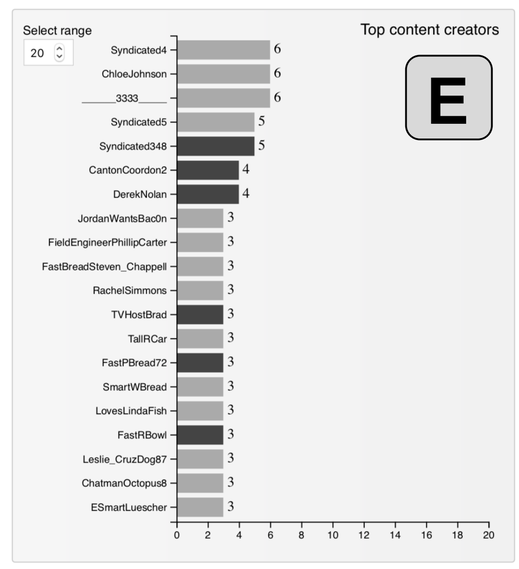


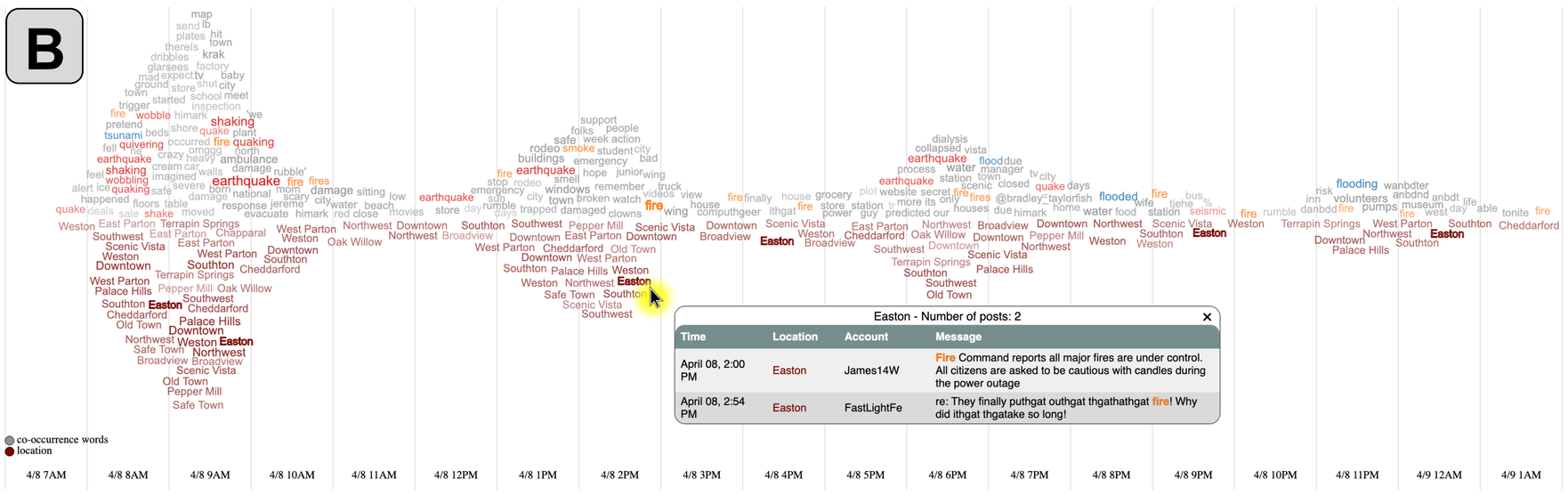


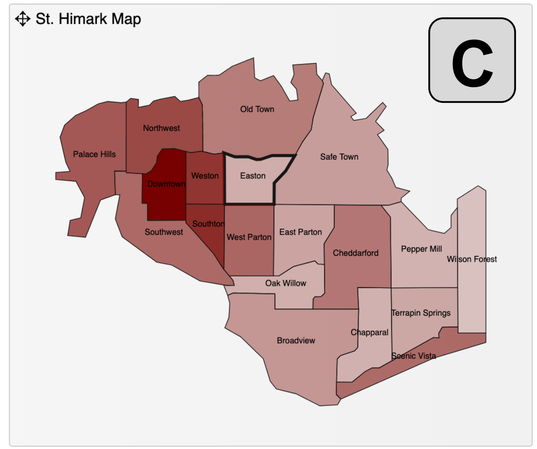


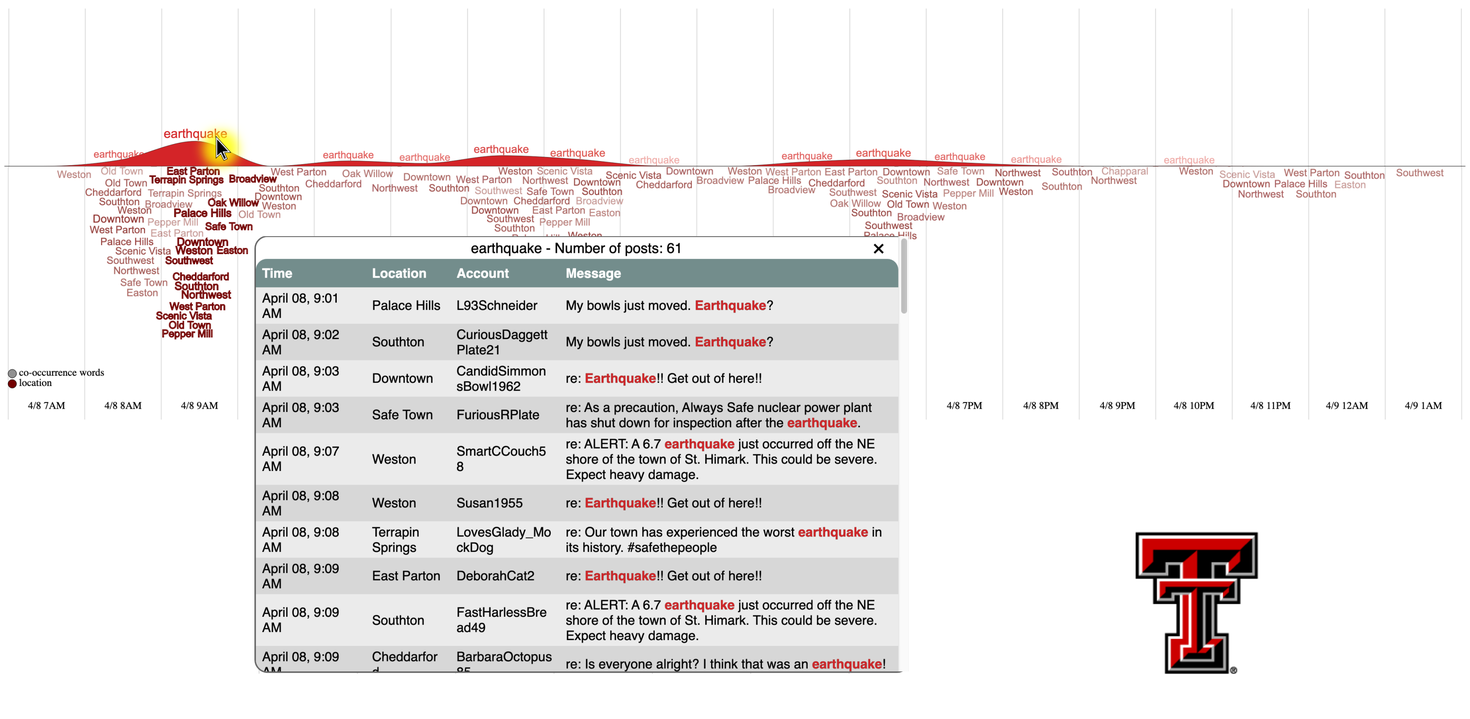












References

[1] Tommy Dang, **Huyen N. Nguyen**, and Vung Pham, "WordStream: Interactive Visualization for Topic Evolution," in *EuroVis 2019 - Short Papers* (J. Johansson,F. Sadlo, and G. E. Marai, eds.), The Eurographics Association, 2019, doi: 10.2312/evs.20191178.

[2] **Huyen N. Nguyen** and Tommy Dang, "EQSA: Earthquake Situational Analytics from Social Media," in *2019 IEEE Conference on Visual Analytics Science and Technology (VAST)*, Vancouver, BC, Canada, 2019, pp. 142-143, doi: 10.1109/VAST47406.2019.8986947.