EventPeriscope: a Pipeline to Analyze the Impact of Real-World Events on Twitter Discussions

Abstract
EventPeriscope is a pipeline designed to analyze and measure changes in the dynamics of Twitter discussions in response to real-world events. Such analysis provides valuable insight about the association between the dynamics of tweets and real-world events.

Introduction
► Twitter is a valuable source to investigate whether a particular topic is drawing public’s attention.
► Question:
  • How much the public care about Zika outbreak?
  • Are discussions about Zika influenced by real-world events such as Olympic Games?
► Our Solution:
  • A pipeline, which utilizes signal processing, text mining, and NLP techniques, to quantify the effects of real-world events on Twitter discussions.

EventPeriscope Pipeline

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Signal Constructor | Peak Detector | Content Analyzer (CA) | Visualizer (VIS)
---|---|---|---
Time Discretizer | Wavelet Constructor | Keyword Extender | Tweet Selector
Smother | Wavelet Transformer | Keyphrase Extractor | Plotter

Tweet Dataset

Empirical Study: Zika Virus Outbreak
► Zika virus got epidemic in Brazil in early 2015
► Zika virus spread to most parts of south and north America in 2016.
► Investigate the influence of real-world events on Zika discussions on Twitter:
  • WHO announced a Public Health Emergency of International Concerns (PHEIC) on Feb 1, 2016.
  • Rio 2016 Olympic Games were held Aug 5-21, 2016.

Figure 1: Peaks detected by EventPeriscope on constructed Zika signal.

Figure 2: The impact of WHO PHEIC on the dynamics of Zika discussions.

Figure 3: The Impact of Rio Olympics on the dynamics of Zika discussions.