# Abstract (250 words):

**A conceptual framework for studying reactions to events in location-based social media**  
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event, reaction, spatial-temporal, social, semantic, information-spread

Events are a core concept of spatial information (Kuhn 2012), and location-based social media (LBSM) provide information on reactions to events. Individuals have varied degrees of agency in initiating, reacting to or modifying the course of events and reactions can take the form of observations of occurrence, expressions containing sentiment or emotions or a call to action. Key characteristics of reactions in LBSM include a referent event and information about who reacted, when, where and how, as well as information relating one reaction to others. Collective reactions are composed of multiple individual reactions sharing common referents. They can be characterized according to the following dimensions: spatial, temporal, social, semantic, interlinkage. Our conceptual framework allows us to characterize and compare reactions. For instance, for a thematically well defined class of event such as cherry blossoming we can explore differences and similarities in space and time in different towns, countries and even cultures. Other events may have very complex spatio-temporal signatures (e.g. political processes such as Brexit or elections) which may be decomposed into a series of individual events (e.g. a temporal window around the result of a vote) whereby reactions can be characterised and compared with respect to this event. The purpose of our framework is twofold: firstly we explore ways in which reactions to events in LBSM can be usefully described and secondly, we use the framework to underpin the development of methods for analyzing and understanding collective reactions to events.

Kuhn, 2012: Core concepts of spatial information for transdisciplinary research. IJGIS, 26 (12), 2267-2276.

These dimensions are based on characteristics.. This equally encompasses the information spread that occurs as part of the discourse…

when the event is reacted upon… sophisticated process/interaction/feedback loop (e.g. changing options during process), biasing effects of networks

* People increasingly express feelings on social media
* this paper focusses on the impact of events in terms of people’s reactions that can be found in social media
* important characteristic

Express their opinions and thoughts

# Outline for paper:

1. (Ross) Intro and motivation

Anwender: Planners & journalists, decision makers, sociologists  
 Audience: Researcher

2. Examples (to set the context and scope for the following sections): brexit (local event with global impact: Farage and Cameron conceding defeat (reverse of sentiment expected/ spatial pattern?/ temporal pattern?)), cherry blossoming (worldwide to local scale), storm in Germany (<https://en.wikipedia.org/wiki/St._Jude_storm> ) + smth with local characteristics (e.g. one of 1,000,000 Swiss referendums)

3. Literature review (W.Kuhn 2012, Galton and Mizuchi 2009, K.Beard 2008, data mining, ...)

3.1. (Dirk, Alexander) Brief discussion of event literature: distinction between ontologically based and data/ methods driven definitions

3.2. (Eva) Literature exploring works on reactions to events

Brief overview of domains exploring reactions (e.g. social science, qualitative research; data mining; information science;

3.3. Data mining and data dimensions (methods)

Temporal & spatial, interlinkage, social (==”population”, or a set of discrete objects in G.Klir’s terms), thematic & character/type/kind of reaction

4. Conceptual model

4.1. Events

Includes examples of different types of events and explanation of the differences in terms of the “dimensions” (“facets”)

* Event reference
* Who
* When
* Where
* How (Sentiment)

4.2. Reactions to events

4.2.1. Individual reactions

4.2.2. Collective reactions

* Information Spread

4.3. Context of reactions (maybe shift to the discussion)

5. (NA) Analysis tasks

Formally define a system of tasks based on the 5 dimensions defined earlier in the paper x 3 Bertin’s task levels (elementary, intermediate, overall - may be reduced from 3 to 2)

6. (to be written later) Implications / Discussion and conclusions

7. (who?) Acknowledge VGIscience

G.Klir. Architecture of Systems Problem Solving.   
<http://www.springer.com/us/book/9780306473579>

W. Kuhn, 2012: Core concepts of spatial information for transdisciplinary research. IJGIS, 26 (12), 2267-2276.

K. Beard, H. Deese, and N. R. Pettigrew. A Framework for Visualization and Exploration of Events. *Information Visualization* 7 (2008):133–151

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* Introduce Objectives (audience)
* Planners & journalists, decision makers, sociologists

## Definition of Event

* Cognitively labelled
* Temporally referenced
* W. Kuhn; Galton and Mizuchi, 2009 ‘s definition
* Introduce examples (continuum: classes to individual instances):
  + Cherry Blossoms: Event example could be individual, or several Cherry Blossoms or seasons (Flickr)
  + Brexit: Event example could be “Referendum” (Twitter): e.g. Farage conceding defeat; Cameron conceding defeat (reverse of polarity)
  + Snow in UK: Event example could be several snow events (Flickr & Twitter)

## Characteristics of Events

* Event can be characterized in terms of 4 dimensions: spatial, social, thematic, temporal
* subcategories for attributes in each of these dimensions
* people’s perceived (agency) ability to change the event
* Degree of agency (Wirkung) as a continuum
* ‘Agency’ is the degree to which an event is initiated and influenced by people (/actors)
* social characterization of event: situational awareness of observers/witnesses/participants
  + characteristics of events (which may be important for analysis)
    - **When**
      * Start
      * Reoccurrence/ periodicity
      * End
    - **What**
    - Where
    - Who (involved?)
    - Attributes
    - Agency

## Reactions of people to events

## 3.1 Individual Reactions

* reaction is a specific type of event
* definition of individual reactions (single reaction, single person)
* characteristics:
  + characteristics of reaction to events (point in space and time)
    - Event reference
    - Who
    - When
    - Where
    - How (Sentiment)

## 3.2 Collective Reactions

* + characteristics collective reactions (many people), composed of many elementary reactions
* Characteristics of reaction to events based on manifestation/differences in each of the 4 dimensions
* in contrast to events, essential characteristic of reactions: not homogeneous – subjectivity and heterogeneity (across all dimensions: space, time, groups, thematic, character of reaction)
* Information Spread: sophisticated process/interaction/feedback loop (e.g. changing options during process), biasing effects of networks
* Data model: dataset for events (components)
  + 1: Relation of events and reactions to events (4 dimensions)
* notion of **location**: relatedness
* Examples of related Locations:
  + Location of the event
  + Location of reaction to event
  + Social-Demographic:
    - Locations of user:
      * Taken from Profile, Age, Spatial Data Patterns

## Discussion

* Explain how framework is going to be used in event analysis in regard to audience: planners

## Conclusions

Examples of papers looking at reactions in social media

<https://academic.oup.com/jamia/article/22/3/671/776531/Pharmacovigilance-from-social-media-mining-adverse>

<http://link.springer.com/article/10.1007/s13278-014-0206-4>