

# A Neural Model for Joint Event Detection and Summarization

Zhongqing Wang<sup>1,2</sup> and Yue Zhang<sup>2</sup>

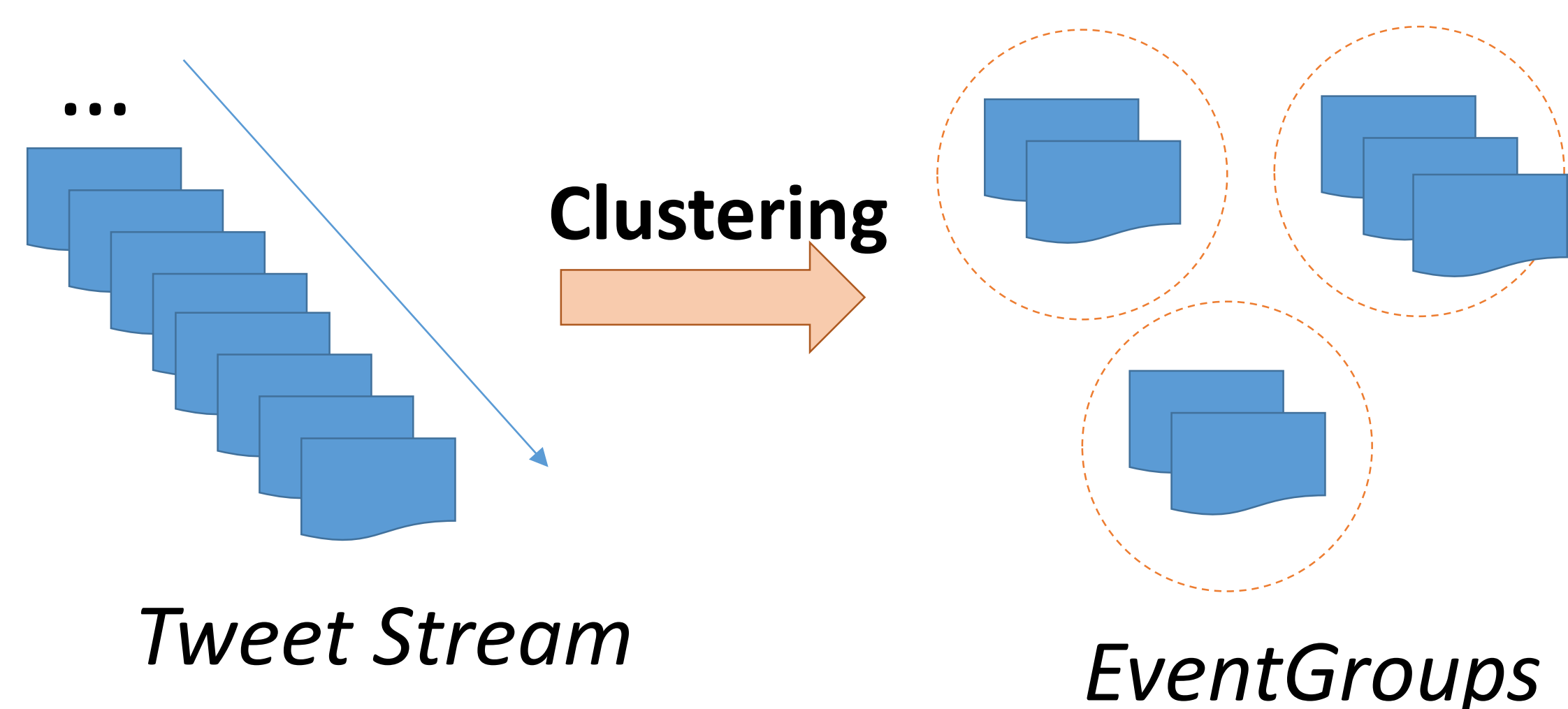
<sup>1</sup>. Soochow University, Suzhou, China

<sup>2</sup>. Singapore University of Technology and Design, Singapore

wangzq.antony@gmail.com, yue\_zhang@sutd.edu.sg

## Tweet New Event Detection

- Aims to *identify first stories* in a tweet stream
- *Incremental clustering* are always used to cluster tweets into event groups.



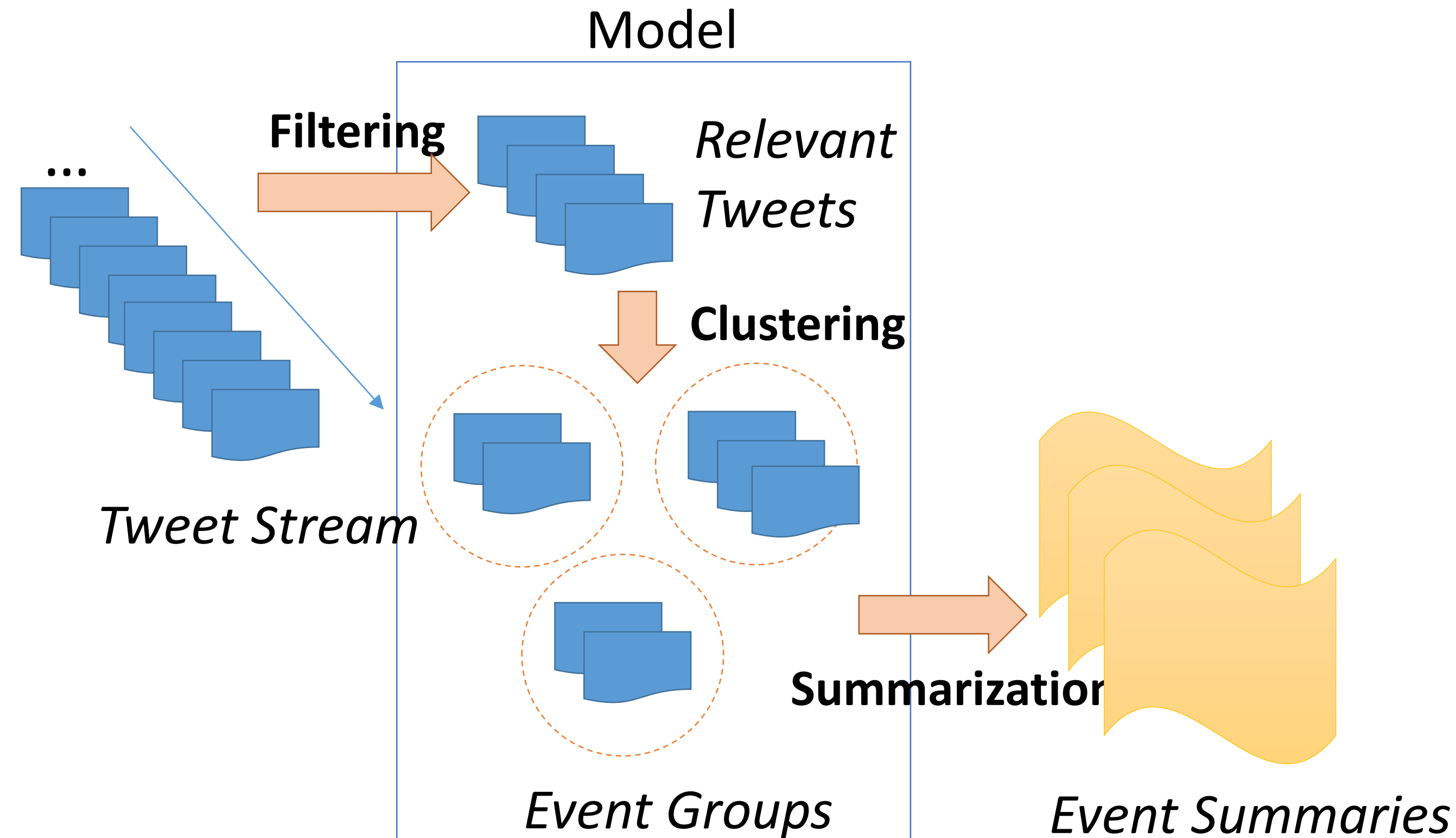
## Challenge & Solution

### □ Challenges:

- There are lots of noise tweets in the tweet stream
- Each event is mentioned by too many tweets

### □ Solution

- *Detect and summarize events as a pipeline system*
- Tweets Filtering
- Event Clustering
- Event Summarization

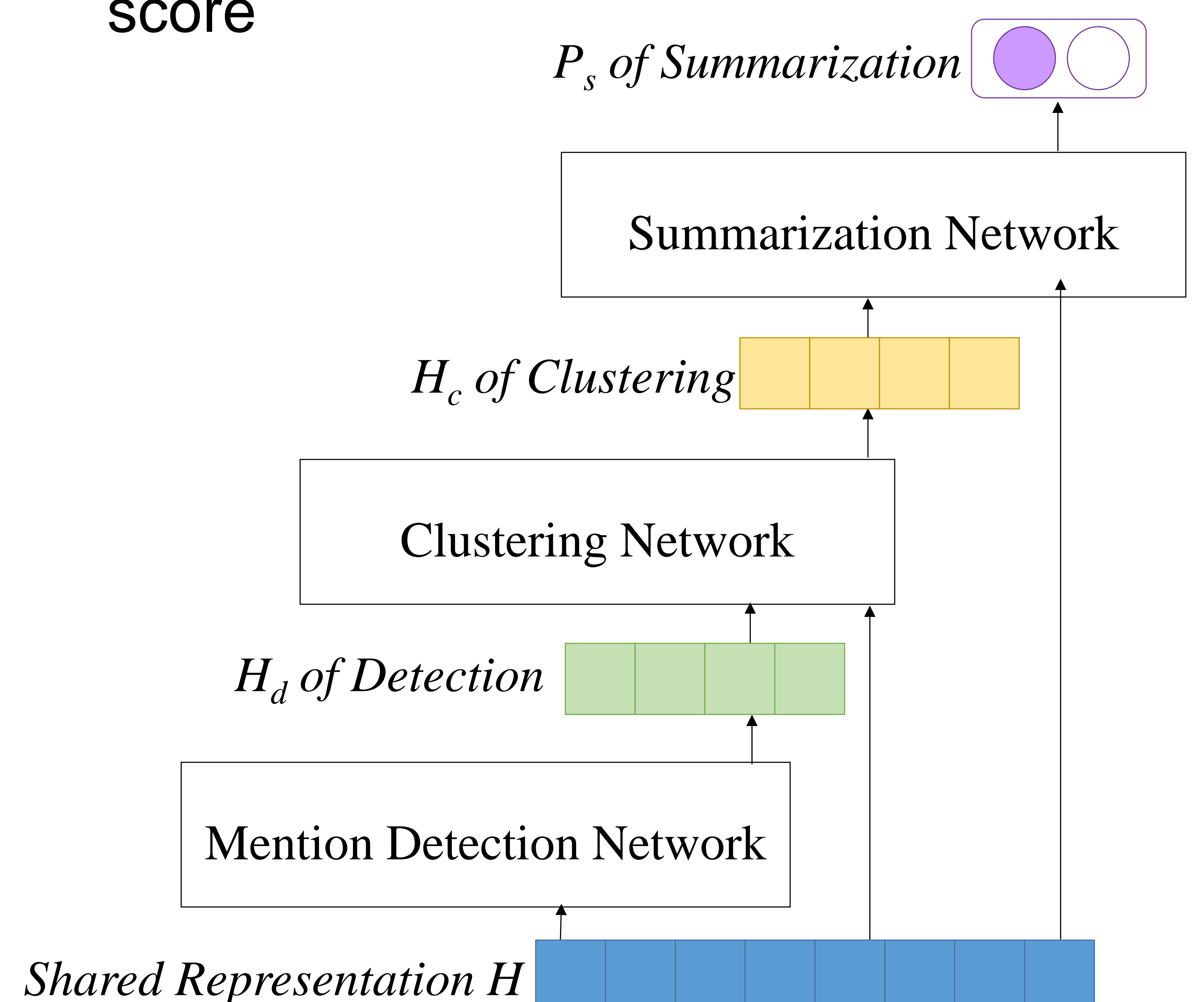


## Data Collection

- All data were collected by using the Twitter streaming API
- The tweets are collected with relevant domain keywords
- Earthquake, DDoS

## Joint Event Detection and Summarization

- Shared Representation
- LSTM
- Joint Model
- **Tweet Filtering.** We classify each tweet in the stream as either being relevant or irrelevant to the events of concern.
- **Event Clustering.** Incremental clustering of tweets.
  - A key issue is the calculation of similarity between tweets.
- **Event Summarization.** We rank all the tweets in the cluster using a probability score



## Experiment Results

Method	C_min
Random	86.2
Cosine-filtering	65.8
Cosine+filtering	60.9
LSTM-filtering	64.4
LSTM+filtering	58.8

*Effective of Event Filtering*

Method	C_min
LSH	66.7
AS12	60.9
<b>JEDS</b>	<b>45.8</b>

*Comparison of clustering algorithms*

Method	ROUGE-1
AS12+LexRank	18.8
AS12+CL16	19.6
LSH+LexRank	17.2
LSH+CL16	19.1
<b>JEDS</b>	<b>21.3</b>

*Comparison of summarization algorithms*