

# EMBERS Experiences

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## ABSTRACT

This paper gives an account of the successful forecasts made by the EMBERS system and reasons out cases where EMBERS didnt perform well.

## Keywords

ACM proceedings; L<sup>A</sup>T<sub>E</sub>X; text tagging

# 1. INTRODUCTION

Introduction goes here

## 2. CIVILUNREST FORECASTING

The following section gives some case studies of EMBERS forecasts over the past few years in Latin America.

### 2.0.1 Successful forecasts

**Brazil Spring (June 2013)** EMBERS, while missing the initial uptick, captured the increase in the order of magnitude of the protest events during the Brazilian Spring and also captured the spatial spread in the events, in addition to forecasting that this would be a "General Population" protest.

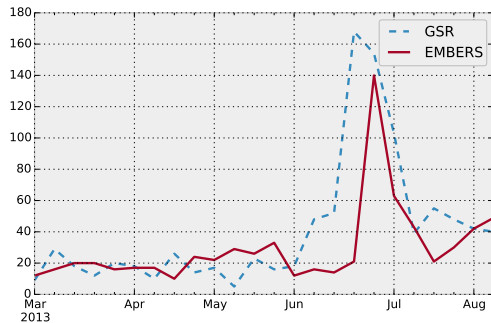


Figure 1: Brazil Spring

**Venezuelan Spring (Feb-March 2014)** EMBERS captured some of the first 'calls to protest' for the trigger city of San Cristobal and its nearby surrounding areas and correctly forecast the population (Education) and that the protests would turn violent. Over the next days, EMBERS closely forecast the spike in the number of events and the spread of the protests to additional cities.

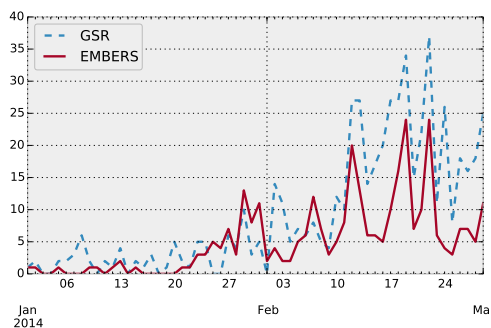


Figure 2: Brazil Spring

**Mexico Protests (October 2014)** EMBERS forecast an uptick of Mexico protests during early October 2014 stemming from kidnappings and killings of student teachers, with a lead time of about 3 days. It also generated a series of alert spikes coinciding with the first large-scale nationwide protests between October 5th to 8th.

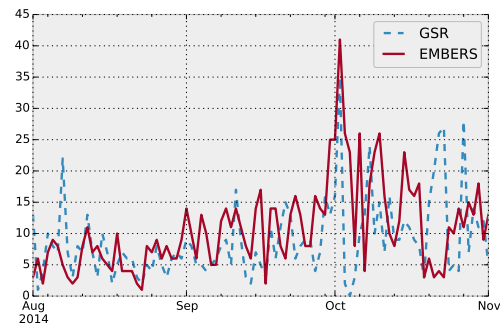


Figure 3: Brazil Spring

### Colombia (December'14 -March'15)

EMBERS successfully forecast the uptick in the number of events during the middle of December 2014 and also the increase in protest counts during February 2015, though in the latter case EMBERS over predicted the counts. The uptick in December 2014 was led by the opposition leader Alvaro Uribe against impunity. Whereas the increase in protest counts in February 2015 was due to trucker's strike against increase in fuel price.

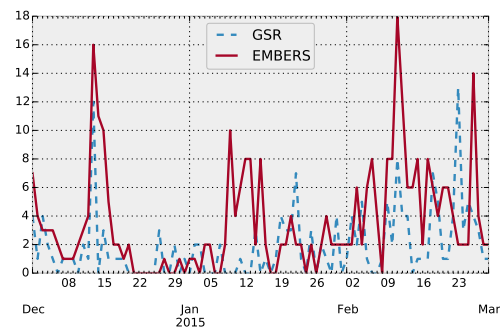


Figure 4: Colombia Protests

### Paraguay (February 2015)

EMBERS forecast the uptick in number of protest events in Paraguay during mid February 2015. The events were mainly due to the lack of opportunity and basic needs and against the introduction of new public-private partnership law.

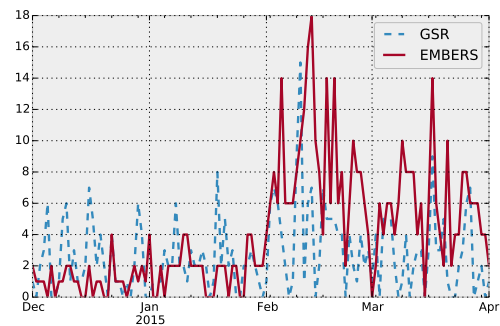


Figure 5: Paraguay Protests

**Venezuelan Spring (Feb-March 2014)** EMBERS cap-

tured some of the first ‘calls to protest’ for the trigger city of San Cristobal and its nearby surrounding areas and correctly forecast the population (Education) and that the protests would turn violent. Over the next days, EMBERS closely forecast the spike in the number of events and the spread of the protests to additional cities.

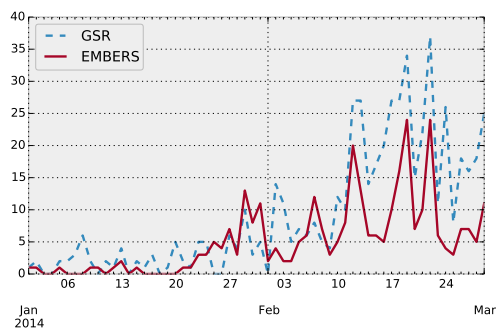


Figure 6: Brazil Spring

## 2.0.2 Failures

some examples here

### 3. INFLUENZA-LIKE-ILLNESS FORECASTING

In this section we analyze the forecasts generated for Influenza-like-Illness or ILI events. For ILI, we concentrated on short-term forecasts for the first 2 years of EMBERS. We shifted our focus to long-term forecasts for the subsequent years. We analyze both types of forecast here for general performance and analyze in details a few successful forecasts which showcased the strength of our system. There were a number of EMBERS ILI forecasts which significantly deviated from the target sources. We analyzed these scenarios and discuss in details some of the weakness of EMBERS. These scenarios also helped us to increase the robustness of our system.

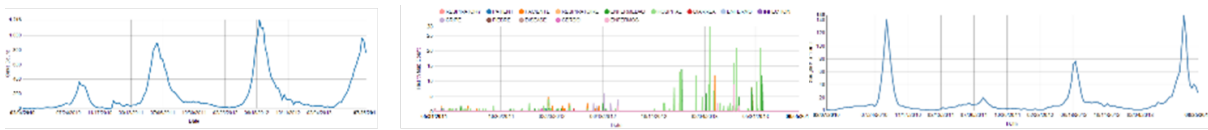
#### 3.1 successes

*[Prithwish: Long-term and short term]*

- **Short-term:** ILI case counts for Chile for event date 08/07/13.
  - Actual value: 626
  - First update: 581 (QS: 3.71)
  - Second update: 619 (QS: 3.95)
  - Possible reason: season occurring around same time, similar shape.
- **Long-term:** ILI seasonal predictions for Bolivia
  - Total flu/SRV count
  - Peak date for flu/SRV

#### 3.2 failures

- **Short-term:** ILI case counts for Argentina
  - Seasonality?
- **Long-term:** ILI seasonal predictions for Mexico
  - Shifts in seasons.



ILI is decreasing in Chile. (a) PAHO, (b) Healthmap, and (c) GFT.



ILI is increasing in Chile. (a) PAHO, (b) GST, and (c) GFT.

(b)

Figure 7: ILI short-term: success stories

## **4. RARE DISEASE FORECASTING**

### *4.0.1 Successful forecasts*

some things here

### *4.0.2 Failures*

some examples here

## 5. CONCLUSIONS

This paragraph will end the body of this sample document. Remember that you might still have Acknowledgments or Appendices; brief samples of these follow. There is still the Bibliography to deal with; and we will make a disclaimer about that here: with the exception of the reference to the  $\text{\LaTeX}$  book, the citations in this paper are to articles which have nothing to do with the present subject and are used as examples only.

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## 6. REFERENCES