Mobility Pattern and Event Detection Using Twitter Data

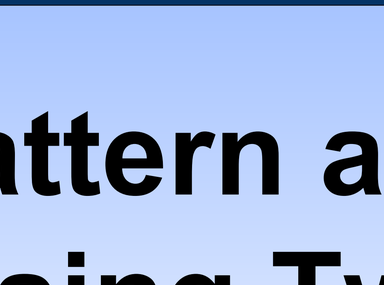
Soroosh Shafiee, Farnood Salehi, Araz Yaqubov

École polytechnique fédérale de Lausanne (EPFL)

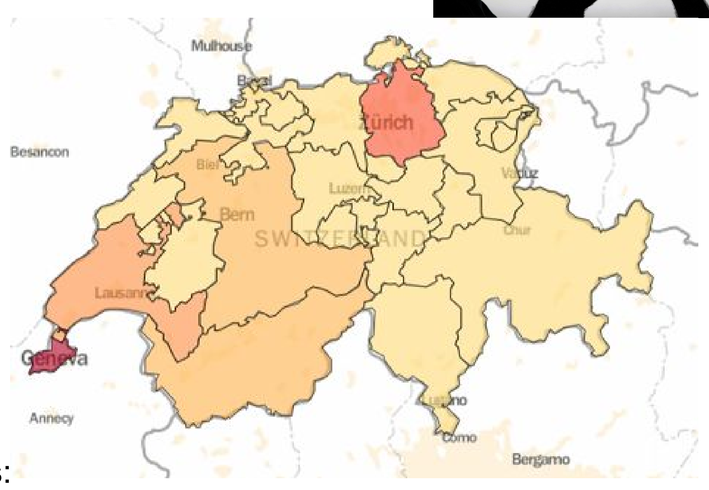
Introduction

The aim of this project is to:

- ➔ extract information from tweets
- ➔ understand human mobility patterns
- ➔ detect important events



Data Description:



Main assumptions:

1. We consider active users for mobility detection
2. We consider English tweets from 2016 for event detection

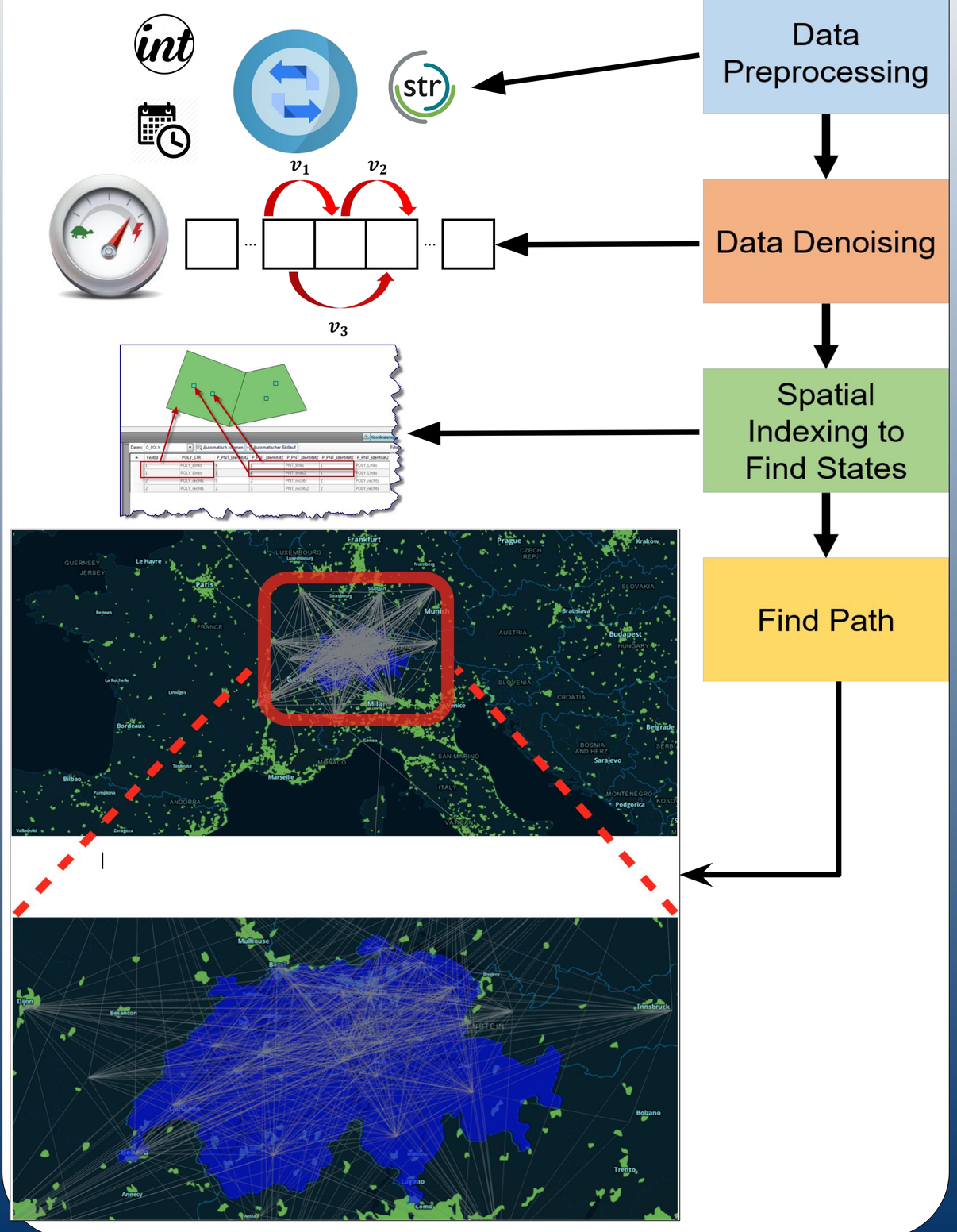
Moblity Pattern

Main tools:

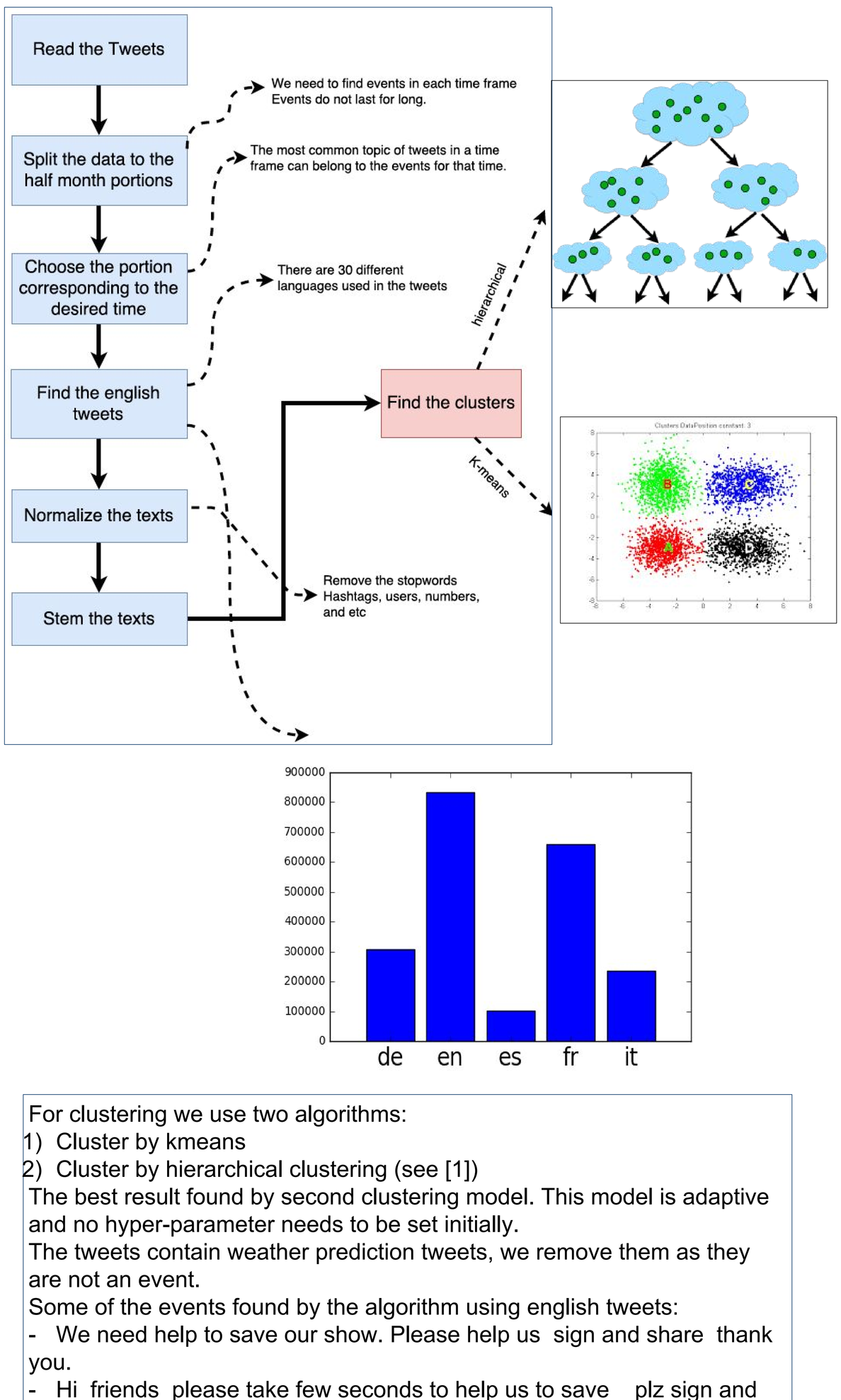
Geopandas

Geojson files

Flow Chart:



Event Detection



For clustering we use two algorithms:

1) Cluster by kmeans
2) Cluster by hierarchical clustering (see [1])

The best result found by second clustering model. This model is adaptive and no hyper-parameter needs to be set initially.

The tweets contain weather prediction tweets, we remove them as they are not an event.

Some of the events found by the algorithm using english tweets:

- We need help to save our show. Please help us sign and share thank you.
- Hi friends please take few seconds to help us to save plz sign and share thanks
- Yesterday One local outdoor pools transformed refugee camp people

Warning:

Clusters do not represent events necessarily, for example,

- Flirting messages!!!! my biggest dream is to wake up one day and see your follow tysm for EVERYTHING, follow me pls, ilysm
- Weather predictions

Bibliography

[1] Ifrim, Georgiana, Bichen Shi, and Igor Brigadir. "Event detection in twitter using aggressive filtering and hierarchical tweet clustering." Second Workshop on Social News on the Web (SNOW), Seoul, Korea, 8 April 2014. ACM, 2014.

[2] Jurdak, Raja, et al. "Understanding human mobility from Twitter." PloS one 10.7 (2015): e0131469

[3] Cho, Eunjoon, et al. "Friendship and mobility: user movement in location-based social networks." Proceedings of the 17th ACM SIGKDD international conference on Knowledge discovery and data mining. ACM, 2011.