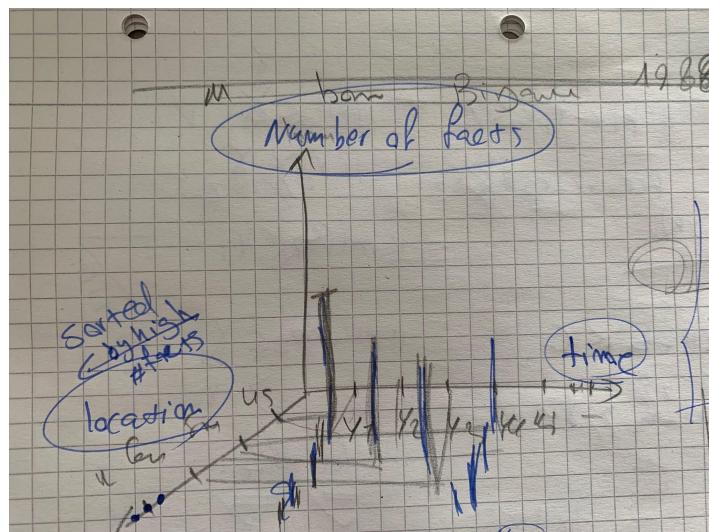


Visualization:

visul 1

location, time and number of facts in one graph



Separate graphs to show statistics of location and year/time

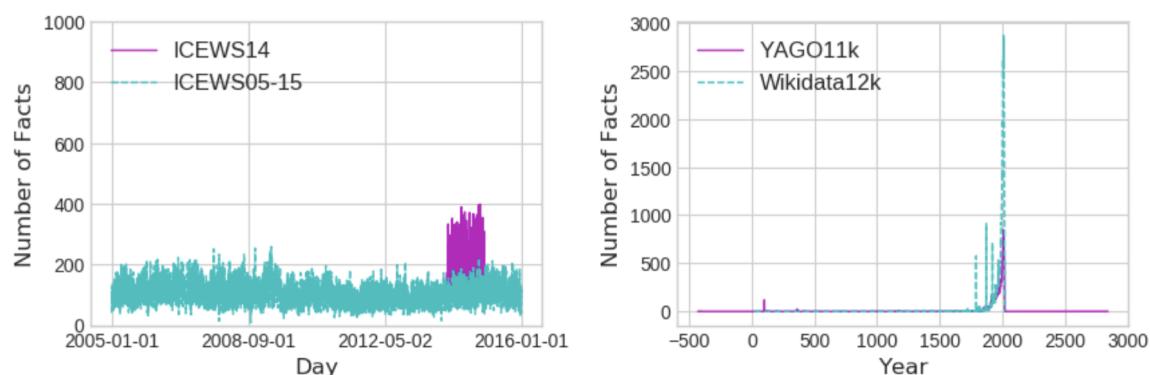


Figure 2: Time distribution of numbers of facts.

visul 2:

Clustering of time and location vectors either use PCA or TSNE:

plot embedding of time, embedding of location

for different regularization:

--reg 0.0

--reg 0.1

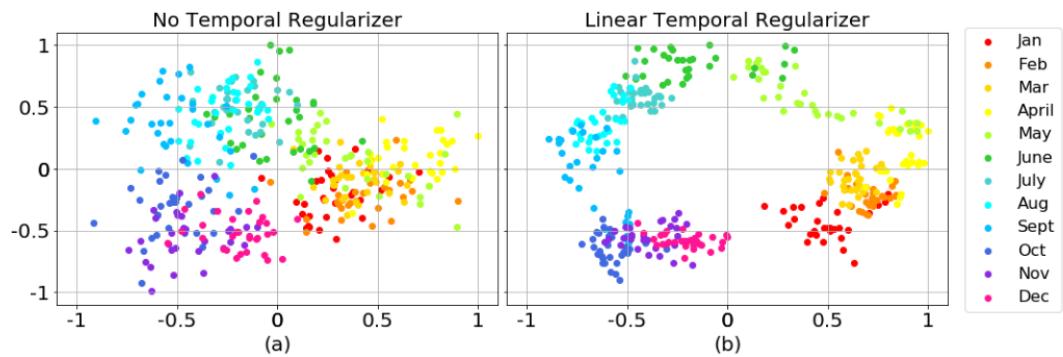
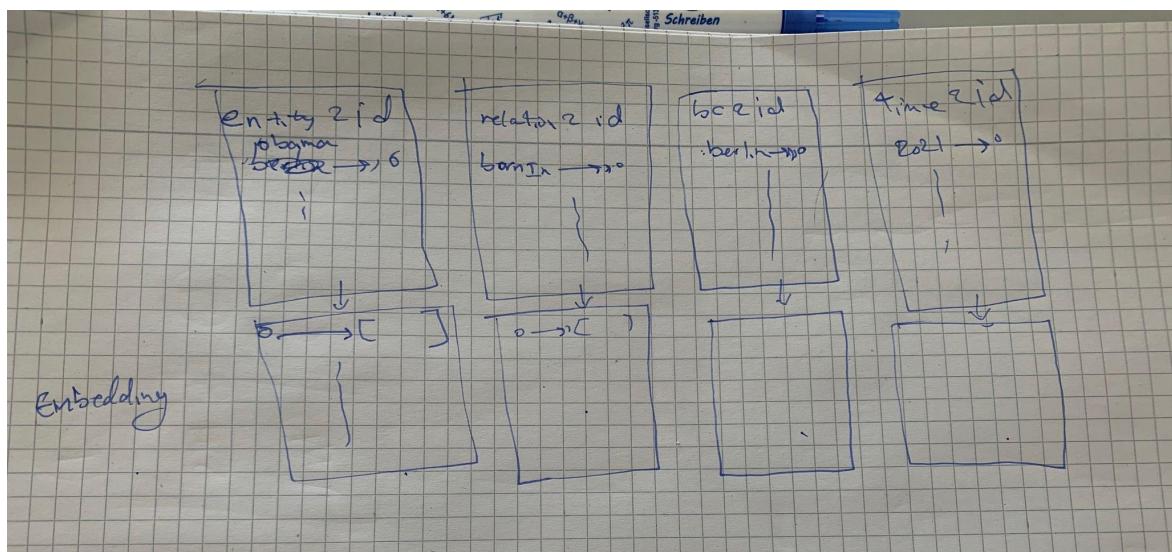


Figure 3: The figure illustrates 2-d PCA projection of the 2000 dimensional time embeddings which are obtained after training TeLM on ICEWS14 with a smoothing temporal regularizer and a linear temporal regularizer. Time points in different months are represented with different colors

you have all files related to entity2id and relation2id, location2id, and time2id. Mojtaba will give a file that has embeddings of entities with their IDs.

the you plot different events by retrieving facts from these files. then we will cluster events for example



you should define the events that we want to plot yourself.

visul3:

performance analysis of datasets by adding location, time and both

visul 4:

Location/event on map together with another information

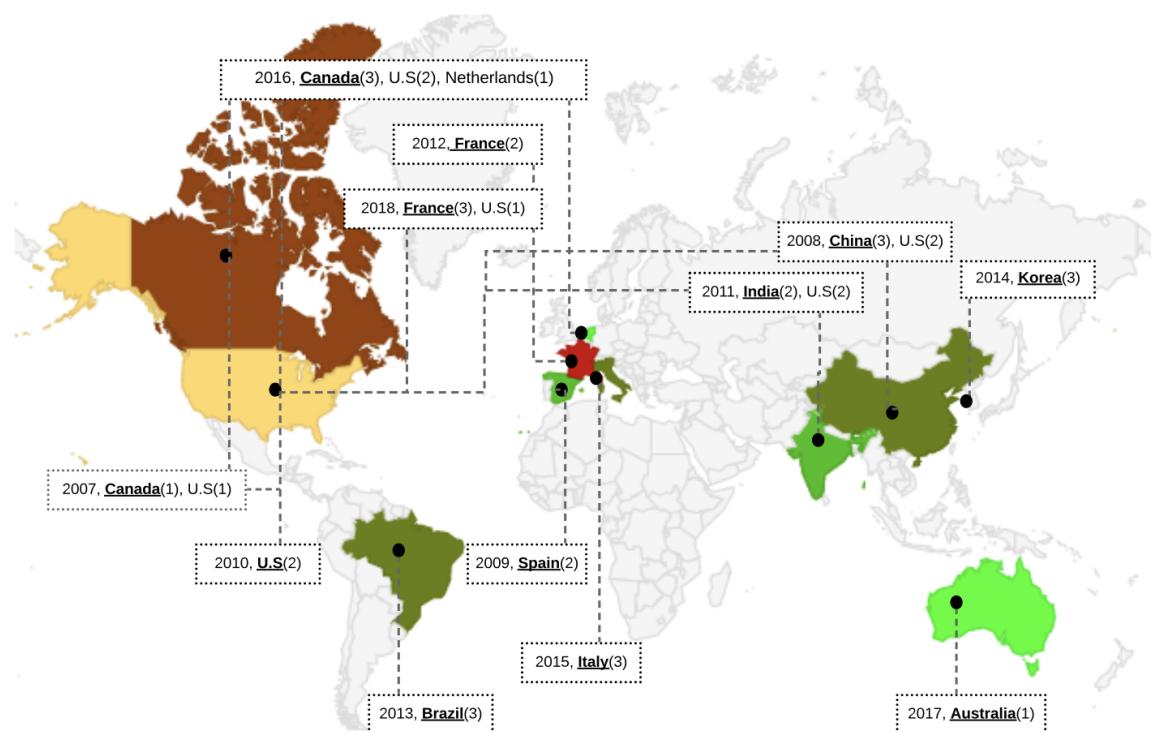


Fig. 5: Relation of event location and people organizing the event, looking at last 11 years of the WWW conference (TheWebConf)

Dataset	#Entities	#Relations	Period(year)	#Train	#Valid	#Test
ICEWS14	6,869	230	201	72,826	8,941	8,963
ICEWS05-15	10,094	251	2005-2015	368,962	46,275	46,092
YAGO11k	10,623	10	-431-2844	16,406	2,050	2,051
Wikidata12k	12,554	24	19-2020	32,497	4,062	4,062

Table 1: Statistics of datasets.

Link Prediction	TeRo with $u = 1$ day	TeRo with $u = 365$ days
Colombia, Host a vist, ?, 2014-06-04	Kyung-wha Kang	John F. Kelly
Head of Government (China), visits, ?, 2014-07-04	South Korea	Serbia
UN Security Council, Criticize or denounce, ?, 2014-08-10	North Korea	Armed Band (South Sudan)
South Korea, Host a vist, ?, 2014-06-20	Kim Jong-Un	National Security Advisor (Japan)
Police (Australia), Accuse, ?, 2014-10-22	Criminal (Australia)	Citizen (Australia)

Table 5: Examples of link prediction results on ICEWS14. The correct predictions are written **bold**.