1. INTRODUCTION
The problem of forecasting geopolitical events has always brought a lot of attention to the machine learning community. For example, forecasting the result of an election, predicting protests and terrorism attacks, etc. These geopolitical events could be very rare. For example, Country A attacking Country B might not have happened many times before. So, one of the challenges is to deal with lacking of the base rate data. To address this challenge, people leverage different datasets, like surveys, social media and newspapers data as a proxy.

2. PROBLEM DEFINITION
My goal is forecasting geopolitical rare events, using geopolitical knowledge graphs.

3. INTRODUCTION
There are two major geopolitical datasets (There might be more).
A. GDELT: Global Database of Events, Language, and Tone
B. ICEWS: Integrated Crisis Early Warning System Dataverse

These datasets are knowledge graphs extracted from news articles and Include coded interactions between socio-political actors. Both of them use Conflict and Mediation Event Observations (CAMEO) coding scheme.

A CAMEO-coded dyadic event consists of four pieces of information:
A sender, a receiver, an action type, and a times-tamp
Example:
Dec. 25, 2014: “Turkish jets bombed targets in Syria.”
Extracted to: (Turkey, Syria, Fight, 12/25/2014)

4. PLAN
There are already some works on the GDELT and ICEWS dataset. My plan is to at the first week do a literature survey on the different methods and problem settings.
The paper I want to focus on for now is:
- Know-Evolve: Deep Temporal Reasoning for Dynamic Knowledge Graphs
- Bayesian Poisson Tucker decomposition for learning the structure of international relations
- Bayesian Poisson tensor factorization for inferring multilateral relations from sparse dyadic event counts

There are basically three different approaches:

1. Using combination of neural networks and point process
2. Different HMM based models
3. Tensor factorization.

The papers on tensor factorization models are mostly about inference on these knowledge graphs. I want to focus on tensor methods that are capable of forecasting.