



Forecasting Civil Unrest

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Overview

- **The Arab-Spring was a series of anti-government protests, uprisings, and armed rebellions that spread across much of the Arab world in the early 2010s.**
- **What ensued lead to the death of Muammar Gaddafi in Libya, the Syrian Civil war, and rise of the Islamic State**



Problem Statement

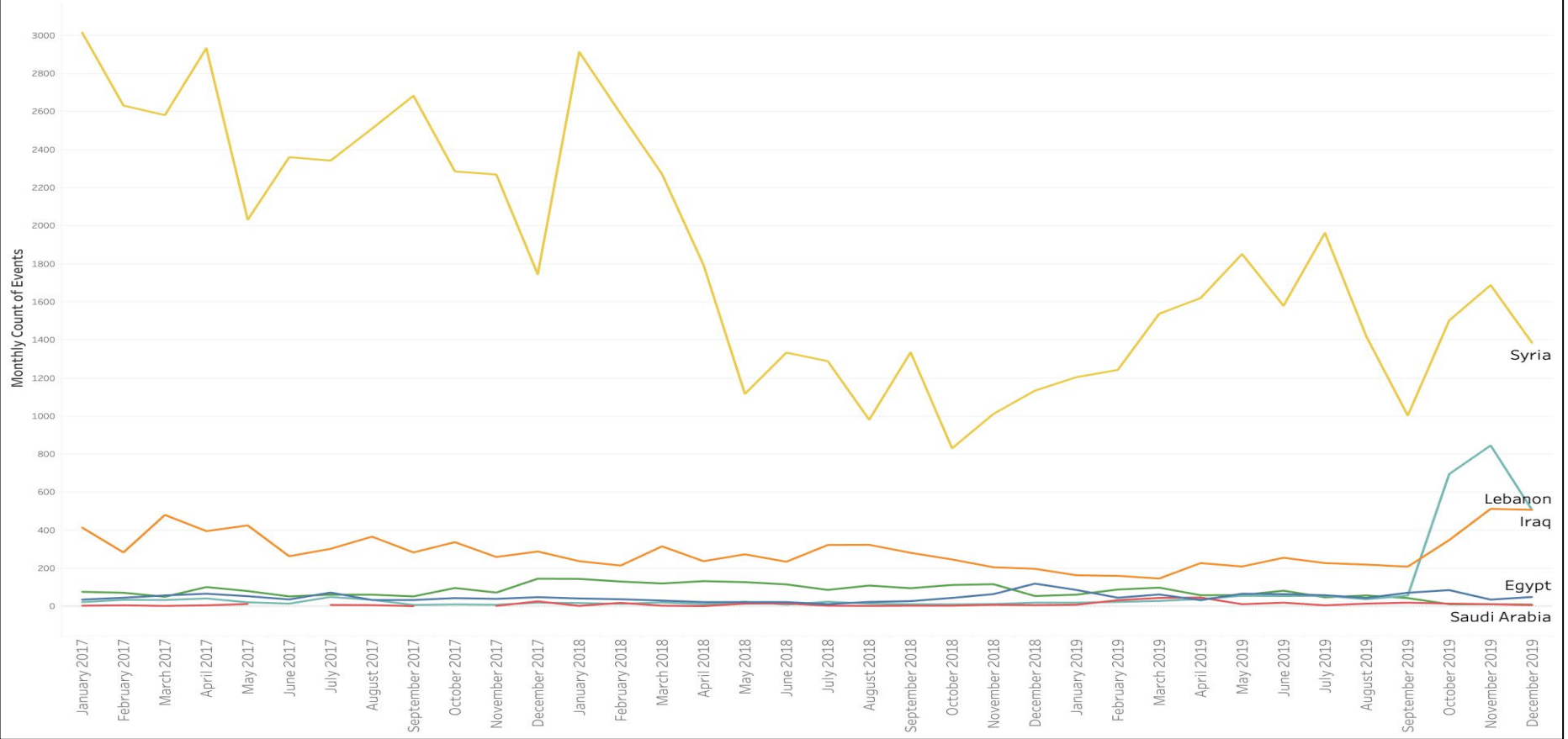
- Is there any pattern we can learn to forecast social unrest events from the data in our day-to-day life, such as general social sentiment, economic, or political developments?
- Given a location (i.e. country, city), can we predict the weekly CU event counts accurately in advance?



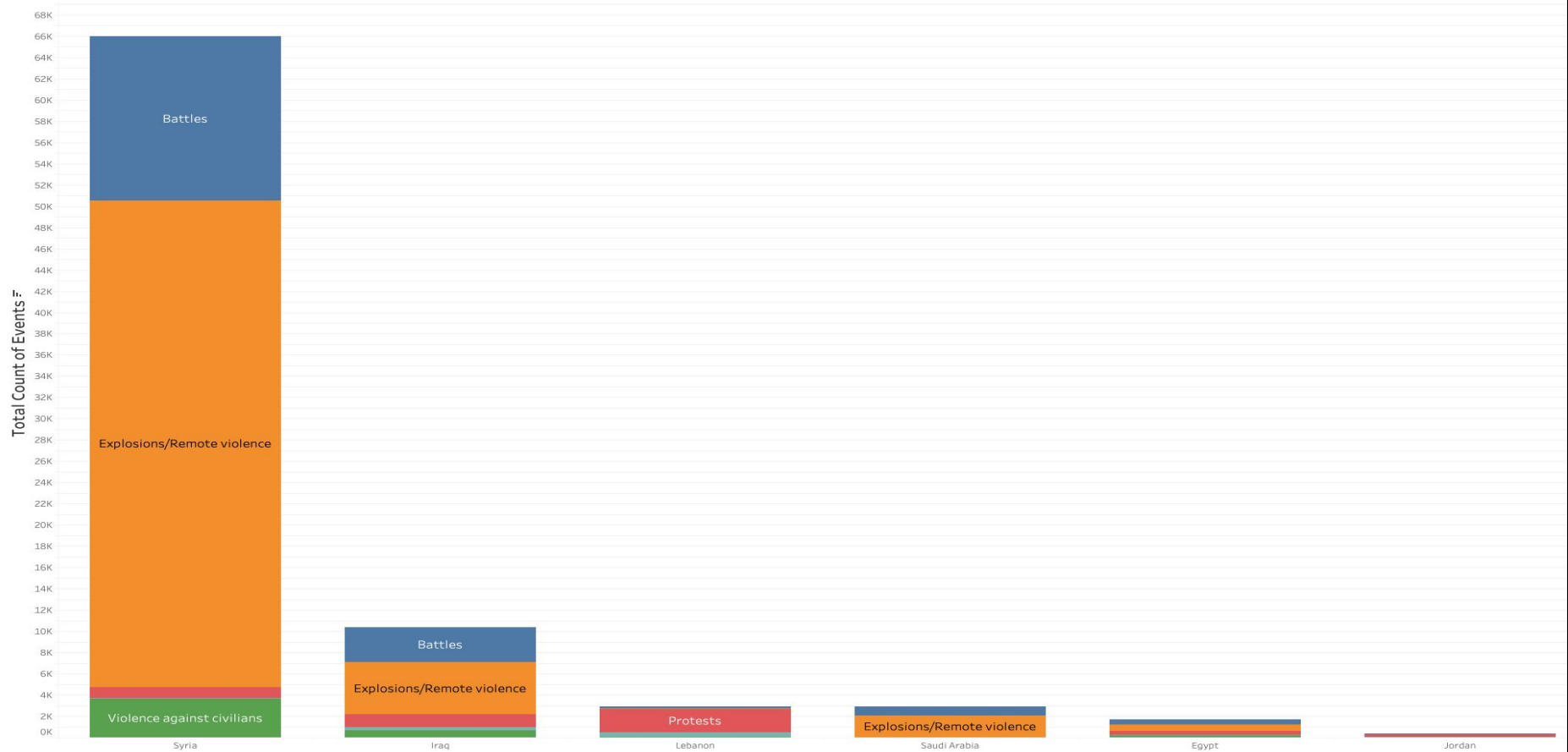
Countries Observed

- Egypt, Iraq, Jordan, Lebanon, Saudi Arabia, and Syria were chosen to forecast
- Social Unrest data was collected through the Armed Conflict Location & Event Database ([ACLED](#))
- [Tor Metrics](#) were used to analyze anonymous internet usage.
- Economic and political indicators collected from [TheGlobalEconomy.com](#)
 - Exchange Rate (USD)
 - Unemployment Rate
 - Political Stability Index (-2.5 weak, 2.5 strong)
 - Human rights and rule of law index 0 (high) - 10 (low)

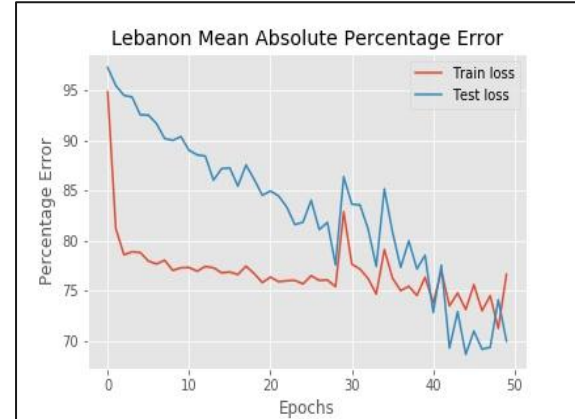
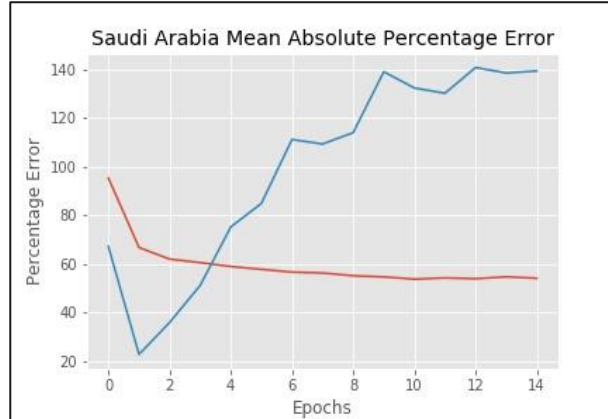
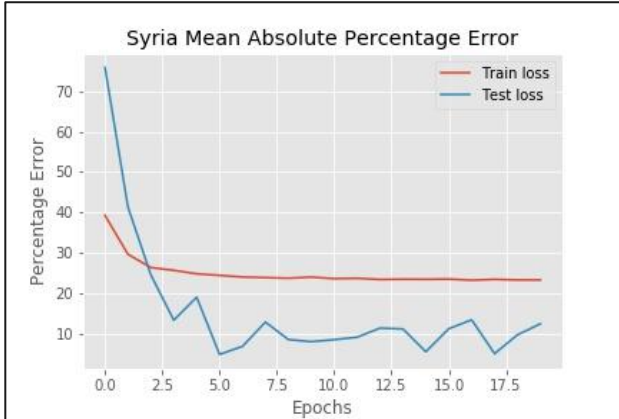
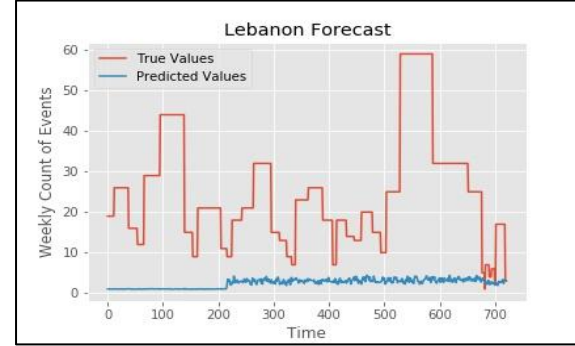
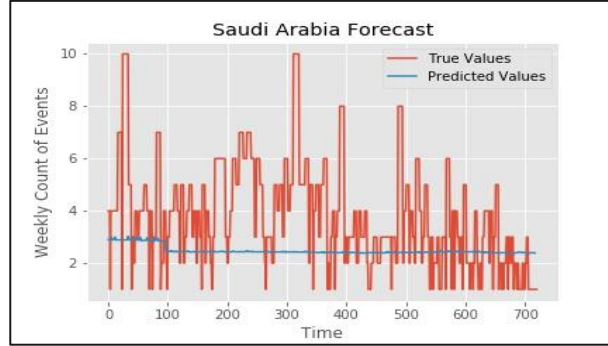
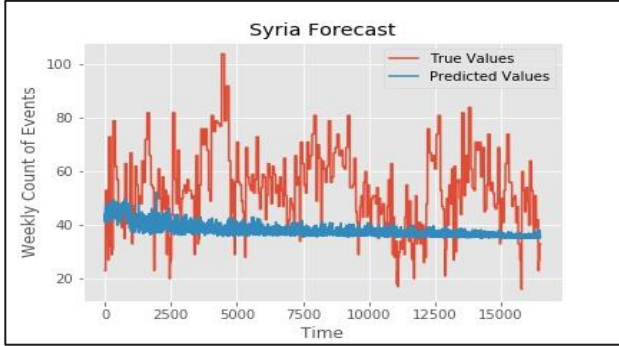
Monthly Count of Events 2017-2019



Conflict Event Type By Country

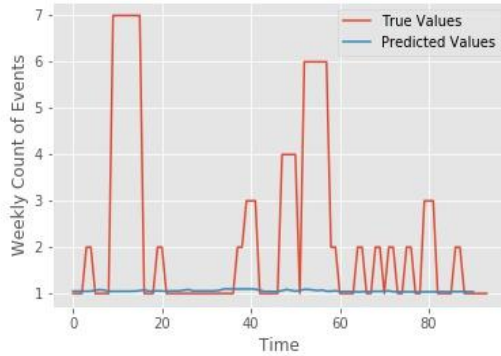


RESULTS

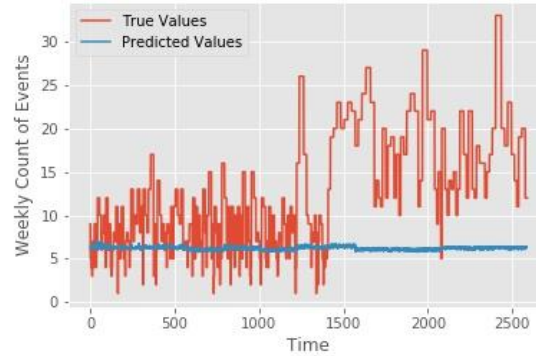


Results Continued

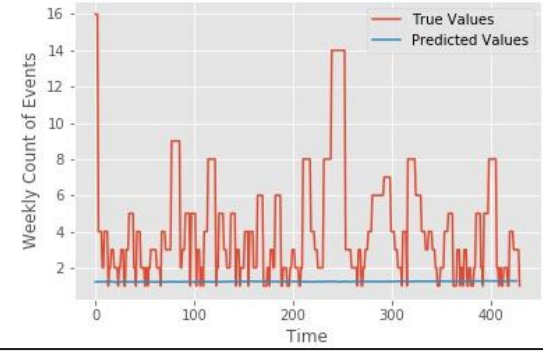
Jordan Forecast



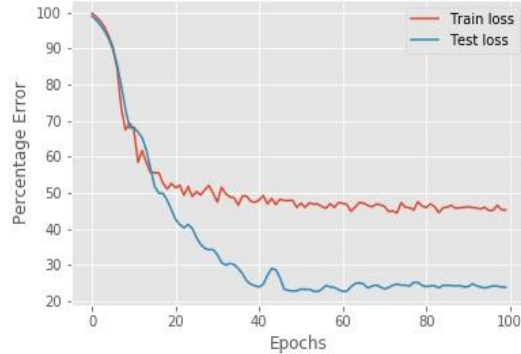
Iraq Forecast



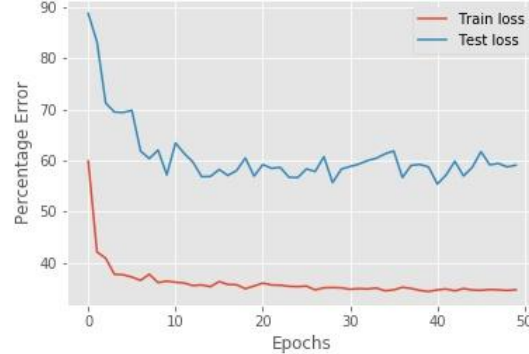
Egypt Forecast



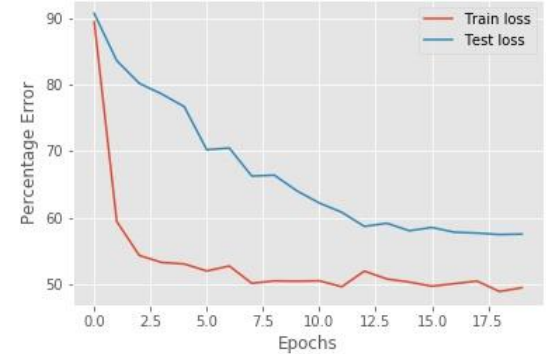
Jordan Mean Absolute Percentage Error



Iraq Mean Absolute Percentage Error



Egypt Mean Absolute Percentage Error





Conclusions

- Regarding Syria, there are some promising results by including data sources for predicting civil unrest and using LSTM models that effectively use sequential data.
- Forecasting other nations observed was unsuccessful, most likely due to smaller observations totals
- Including other heterogeneous data sources like social media will be included in future forecasts

Questions?