

CS287 Project Proposal

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Problem statement

Can one use open-source intelligence data on energy markets to predict diplomatic and informational actions about the Ukraine war from international bodies such as NATO, the EU, and the UN? These bodies are all consensus-based institutions, and positive support by the Nations of these organizations is mandatory for legitimate collective action on any decision to use force.

The task is to see if economic data (Oil Flow) is a forward and predictive indicator of actions in the diplomatic trade space. For example, if there is an increase in oil flow to Germany, will this lead to political resistance (or slow rolling) Leopard Tanks into Poland and a follow on to Ukraine? A second example is looking at the relative flow of oil to get a general view of how an Article 4 or 5 vote may run in NATO. Turkey and Italy, for example, have dramatically increased Russian oil while most of the rest of the NATO nations have turned the Russian Oil Supply off. Is this high level of dependency on Russian oil a precursor to a failed Article 5 vote or appetite to declare an Article 4 vote?

Related work

<https://www.logically.ai/factchecks/library/4e7e10f5> - NATO countries including the U.S. are still buying oil and gas from Russia despite imposing an import ban.

<https://www.nature.com/articles/d41586-019-01312-5> - Model and manage the changing geopolitics of energy.

Data collection, cleaning and exploration plan

Two related sets of data will be required for the energy data:

- 1) International Energy Agency: <https://www.iea.org/data-and-statistics/data-product/monthly-reliance-on-russian-oil-for-oecd-countries>
- 2) US Energy Information Administration Open Data: <https://www.eia.gov/opensdata/>

The hard part will be mapping operational events in Ukraine. The operational map of the invasion is here; this site shows an excellent example of an operational timeline. Resolution of this problem is an essential task in the project.

- 1) Interactive Time-lapse: Russia's War in Ukraine:
<https://storymaps.arcgis.com/stories/733fe90805894bfc8562d90b106aa895>

We will have to investigate to find a reliable way to create and clean the data. Web scraping may need to be used, satisfying a pedagogical goal of the class. The goal is to correlate two normally unrelated datasets, diplomatic/military actions and demand for Russian oil.

Modeling, analysis, and visualization

The modelling, analysis and visualization processes will be performed on an Intel Based i9 Processor running the Windows Operating System. The project is anticipated to use the Anaconda Package with NUMPY, PANDAS, and MATPLOTLIB at a minimum. R and Mathematica may also be used for visualization support. **Project Check In #2 is a critical decision point on which correlation technique to use.**

Needs assessment and contingency plan.

Project is funded and has no resource constraints at this time. Recurring project reviews will adjust contingencies, which are envisaged to be schedule based, if they occur at all.

Timeline



References

1. The consultation process and Article 4
https://www.nato.int/cps/en/natolive/topics_49187.htm
2. Collective defense and Article 5 https://www.nato.int/cps/en/natohq/topics_110496.htm

