Conflict Forecasting Capstone

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Research on international conflict has mostly focused on explaining events such as the onset or termination of wars, rather than on trying to predict them. Recently, however, forecasts of political phenomena have received growing attention. Predictions of violent events, in particular, have been increasingly accurate using various methods ranging from expert knowledge to quantitative methods and formal modeling. This research theme allows students the opportunity to develop their own forecasting project.

Overview

Forecasting political processes has become an increasingly central area of political science and social sciences in general, and has important practical implications. Governments, businesses, finance companies, all have an interest in predicting social phenomena. Conflicts have an major impact on economic, social, and political structures, and therefore, their anticipation is key to preventing them or at least to adjusting governments' or businesses' behaviour to their expected occurrence.

In this module, we will focus on predicting events related to the onset, unfolding, or termination of political violence (or the consequences thereof), such as terrorist attacks, interstate conflicts, civil wars, refugee flows, or human rights violations. Our goal will be to apply existing statistical methods (or develop new ones) to data on these processes, with the goal to anticipate their occurrence. The Research Methods skills taught in Junior Sophister (Research Methods A and B) are sufficient methodological training and background for students to take this Capstone theme. The skills acquired in this module can in turn be broadly applied beyond this class and are highly sought after by employers.

Students are free to choose and develop their own research project in consultation with the theme instructor. The project can employ any appropriate methodological approach of the student's choosing, again in consultation with and advice from the instructor. The module will discuss methodological issues, available data, and the advantages and disadvantages of particular approaches. Possible projects will mostly include combinations of:

- A substantive event to forecast (interstate wars; civil wars; one-sided government violence; human rights violations; genocide; ethnic conflict; terrorist attacks; etc.)

- A particular unit of analysis. Mainly, students may wish to forecast either the timing of an event (e.g., onset, attack, etc.) or its geographical location (e.g., predicting where terrorist attacks will occur).

- A process to predict. This could be the onset, termination, incidence, recurrence, etc., of the substantive event. Students will need to identify a gap in the literature (e.g, a new type of event, unit of analysis, or process to predict) and a method that is adequate for their particular topic, with the help of the instructor. They will aim to identify important predictors and to improve upon existing forecasts.

This module should be an exciting opportunity for students who want to know more about war, conflict, and using data to forecast political events.

Structure

The course is organized around a series of biweekly meetings of two hours (Mondays 12-2pm, 4th floor seminar room, 2 College green). In these seminars we will discuss some of the existing literature, with a particular focus on 'how it's done'. Students will also receive feedback from the instructor, but importantly also from each other. Most of the work will be conducted independently outside of these sessions, and the meetings will be used to guide the student over time

Assessment

Participation (10%)

Students must attend classes and participate. The success of the seminar depends on everyone's contribution to discussions and also on their comments and feedback to others' projects.

Short assignments (20%)

These short assignments will progressively guide you toward the dissertation and ensure that you are progressing in your project.

- Submit three possible research project ideas (max 500 words). Present in class (one slide per idea).
  - 500 words max
  - Due Friday 16 Oct.
  - 3%

- Submit two best revised research projects (max 500 words). Present in class (two slides per idea).
  - 500 words max
  - Due Friday 30 Oct.
  - 3%
- Annotated bibliography on chosen topic. Present in class (3 slides).
  - 500 words max
  - Due nov 30.
  - 4%
- Methodology brief (500 words max). Present in class.
  - 500 words max
  - Due Week 1 of HT
  - 5%
- Podcast or 'whiteboard animation'
  - 5 min.
  - Due end of HT, after submission.
  - Note: for whiteboard animations, see e.g. https://www.youtube.com/watch?v=79FaA_t5zmk
  - 5%

Research Proposal (1500 words). This will be due Friday 8th November

This research proposal is the first main step toward your dissertation. In it, you should present your topic and overall relevance; describe the puzzle to be addressed; review the relevant literature; present your theory; outline the method to be used and the expected results

Dissertation (70%)

This is the main requirement of the Capstone project. The details of the dissertation are laid out in the general Capstone document.

You may find the following book useful as a general guide to writing a thesis: Lipson (2018)

Seminar 1:

- Readings:
  - Cederman and Weidmann (2017)
  - Arrow et al. (2008)
  - Hegre et al. (2017)
  - Chadefaux (2017)
- Outline of class
  - Techniques: Overview of the main techniques used in the field. Statistical, wisdom of crowds, experts, etc.
  - Substantive: What do we forecast, and with what variables?
  - Practical example in class: downloading and loading data, statistical software
  - Discussion: Thinking about your project
  - Projects: First round-up of initial thoughts

Seminar 2: Basic statistical models: how do we 'do' it?

- Readings:
  - Goldsmith et al. (2013)
- Outline of class
  - Techniques: Very basic models. Regression.
  - Substantive: Forecasting interstate wars

  - Practical example in class: a simple logistic regression example
  - Discussion: Work through Goldsmith et al. (2013)
  - Projects: Presentations of research project ideas. What is your dependent variable, independent variable?

Seminar 3:

- Readings: Mueller and Rauh (2018) (technical, skip the math if you want)
- Outline of class
  - Techniques: Data collection, web scraping etc.
  - Substantive: Forecasting intrastate wars
  - Practical example in class: scraping a simple website
  - Projects: Updated project ideas

Seminar 4: No class (Public Holiday)

Seminar 5

- Readings
  - Muchlinski et al. (2016)
- Outline of class
  - Techniques: More advanced methods: Random forests, neural networks, etc
  - Substantive: Time and Space
  - Practical example in class: A simple random forest applied to intrastate wars
  - Discussion: Work through Muchlinski et al. (2016)
  - Projects: Present annotated bibliography

Seminar 6: Presentations and group work

- Readings: Montgomery, Hollenbach, and Ward (2012) (technical, skip the math if you want)
- Outline of class
  - Techniques: Ensemble models
  - Substantive: Onset, incidence, termination, recurrence
  - Practical example in class: a basic ensemble
  - Discussion: Work through Montgomery, Hollenbach, and Ward (2012)
  - Projects: Present project, current progress

References

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Goldsmith, Benjamin E, Charles R Butcher, Dimitri Semenovich, and Arcot Sowmya. 2013. "Forecasting the Onset of Genocide and Politicide: Annual Out-of-Sample Forecasts on a Global Dataset, 1988–2003." *Journal of Peace Research* 50 (4): 437–52.

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