

ICT and Political Protest

The ICT and Political Protest Project aims to study how the global expansion of the Internet affects the incidence of political protest. It is a collaboration between researchers at ETH Zurich (Xenofontas Dimitropoulos and Eduard Glatz, Communication Systems Group) and the University of Konstanz, Germany (Nils B. Weidmann, Political Science).



The purpose of this thesis is to develop estimation techniques for Internet penetration in developing countries at the sub-national level using as input Internet “background noise” data. Internet background noise is a special type of Internet traffic that is generated by activities like malware scanning towards random destinations. Monitoring network traffic enables to observe Internet background noise generated from various places in the world. For example, a recent study by researchers in University of California, San Diego [1] was able to study Internet censorship in Egypt and Lybia by examining Internet background noise data received by a network telescope in the US. The project will use rich Internet traffic data collected by the Communication Systems Group (CSG) from SWITCH – the academic and research backbone network of Switzerland. Previous work in CSG [2] has developed techniques to extract and classify Internet background noise from the traffic data of SWITCH. The project will leverage this work and will study the following problems:

- 1) How to estimate Internet penetration at the sub-national level from Internet background noise data? The goal here is to come up with reasonable Internet penetration metrics and to validate their accuracy. For validation, we will use as ground truth data from an external source about a specific country. India has been identified as a likely case. One challenge that needs to be taken into account is that Internet geolocation databases are not very accurate at the sub-national level.
- 2) Having established accurate Internet penetration metrics, the project will analyze how the geographical and chronological distribution of protests in India correlates with the development of ICT infrastructure. For this purpose, it will use data about the outbreak of protests in India and Internet penetration statistics extracted in the first task of this project. The goal is to identify if there exist any trends and correlations between ICT development and political protests.

We would be happy to provide you more information about the methodology of the project and answer any questions. Please feel free to contact us.

Requirements: C/C++, networking basics. This thesis offers practical and theoretical tasks including the development of analysis software. The student will acquire experience with crunching big data sets.

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[1] Marina Krakovsky. 2012. Garbage in, info out. *Commun. ACM* 55, 9 (September 2012), 17-19.

[2] Eduard Glatz and Xenofontas Dimitropoulos. 2012. Classifying internet one-way traffic. In *Proceedings of the 2012 ACM conference on Internet measurement conference (IMC '12)*.