

A Mathematical Model of Terrorist Organizations

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Project Scope

My research is in developing mathematical models of terrorism, and of individual terrorist organizations. The goal of these models is to inform counter-terrorism policy.

Recent Progress

In a recently-completed model, I have described the evolution of a terrorist organization like al-Qaeda. The organization is able to grow by publicity-generating attacks, but its growth is checked through counter-terrorism measures. Based on the model, sufficient conditions for the defeat of the organization are proven. Paradoxically, it is shown that under some circumstances, it is necessary to increase the counter-terrorism measures even if the organization is weakening. It is also found that the optimal strategy for destroying a terrorist organization is usually different from the optimal strategy to weaken it.

Future Plans

In the near future, I will be expanding the core model above to include additional phenomena. In the longer term, I plan to develop mathematical models of a similar kind but looking at different aspects of terrorist activity. For instance, it would be interesting to understand the geo-spatial interactions between branches of a single organization. As well, I will be developing agent-based social network models of terrorism, which would mathematically implement recent insights from terrorism research. An important personal objective is to develop contacts with other researchers in the field, as well as agencies interested in this work. I also need to identify a permanent academic adviser that would be interested in working with me on these projects.

Publications since the beginning of the project

The basic model is currently undergoing peer-review. A pre-print version is available at: www.cam.cornell.edu/~gfriend/gutfraind_model.of.terrorism.draft.pdf.