Words into Actions

Terrorist and insurgent groups are among the most pressing current national security concerns for the United States. APL-UW scientists are using the groups’ observable behavior— their public speech—to understand their structure and dynamics. This approach integrates recent advances in network science research, developed primarily by physicists and mathematicians, with social science theory and methods; it involves APL-UW research collaborations with faculty in political science and communications at the University of Washington and other institutions. Researchers seek to improve the ability of intelligence analysts to anticipate terrorist and insurgent behavior and the results have informed analysis efforts in the ongoing Iraq and Afghanistan conflicts. A pilot transition is under way for elements of this research to a Department of Defense operational command.

Observed network of declared joint operations among insurgent groups in Iraq 2005–2007

Models of Terrorist Network Dynamics

Insurgent and terrorist groups are fundamentally political entities. Political systems are difficult to quantify, a problem exacerbated by the covert nature of insurgent and terrorist operations. But these groups are notable for their use of the Internet, satellite television channels, and other public media to convey their messages. One APL-UW research program exploits insurgent groups’ rhetoric—public speech and political declarations—to develop computational models of the groups’ decision making and behavior. Three components of rhetoric were identified as key to insurgent strategic decision making: 1) How do they frame the conflict? Who are the good guys and who are the bad guys? 2) What are their targeting claims? Who do they take credit for attacking? 3) What are their declared relationships? With whom do they cooperate publicly?

There are two distinct but related outputs of this research that can be used to analyze insurgent behavior. The first are data maps drawn from rhetorical components that provide a quantitative and visual representation of insurgency factional structure. For example, the method shows which insurgent groups in Iraq during the period 2003–2009 were most important, their ideological and strategic relationships, and their level of political cooperation. Conventional analysis had divided Iraqi insurgents into two groups—jihadists like Al Qaeda in Iraq and nationalists like the Islamic Army in Iraq. The factional maps generated by this research, however, showed that this binary division was too coarse and that certain groups like the Islamic Army in Iraq—the largest of the insurgent groups—were best considered as hybrid nationalist-jihadists with crucial implications for their strategic decision making.

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Revisions to the observed joint operations networks, reproducing particularly well the separation between the jihadist and nationalist wings of the insurgency. This structure is not reproduced, however, by a social network model that accounts only for insurgent group sizes and not policy differences or leadership inputs.

Because the model simulations are driven with empirical data, the method is more amenable to real-time updates than if analyst judgments were used as input. As groups release statements and claims of attacks, the quantitative variables can be re-estimated and used to refine model predictions. The ultimate application would be to forecast the evolution of the insurgent or terrorist groups’ operational network, assessing how, for instance, efforts to sow discord among insurgent groups may affect tactical cooperation across the insurgency, allegiance shifts, and operational efficacy.

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