CoCo Seminar Series
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Understanding Patterns and Relations of the Terrorist Attacks to Prevent Future Threats

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Terrorists are increasingly using suicide attacks against various targets and the uncertain nature of this terrorism can hinder how to design counter-terrorism policies. The challenge of the government is how to track these attacks, since terrorists have learned how to avoid unsecured communications, such as social media. In most research studies, they have focused on understanding the behavior of individual terrorists (as people) rather than different attacks by modeling their relationship with each other. And, terrorist activity detection focuses on either individual incidents, which does not take into account the dynamic interactions among them; or network analysis, which gives a general idea about networks but it sets aside functional roles of individuals and their interactions. Therefore, we propose a new approach that will better understand the characteristics of future suicide attacks by analyzing the relationship between the past attacks. The proposed approach first identifies relevant features using a new Network-Based Feature Selection (NBFS) method. It then calculates the relationship between selected features, via a new similarity measure, that is capable of handling both categorical and numerical features. We also propose a unified detection approach that applies pattern classification techniques to network topology and features of incidents, so as to detect activity. The new testing data set successfully showed how to find and understand patterns, extracted from the original data set. Moreover, the experimental results for the detection approach outperformed other traditional detection approaches. Policymakers can use these approaches for time-sensitive understanding and detection of terrorist activity, which can enable precautions to avoid against future attacks. Finally, these results could potentially enable law enforcement to propose reactive strategies.

Salih Tutun is a PhD candidate in the Department of Systems Science and Industrial Engineering at Binghamton University. His research interests are data mining and knowledge discovery, and terrorism informatics.

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