

# Identifying the Patterns of Terrorism in India: A Two Mode Social Network Approach<sup>a</sup>

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<sup>a</sup>This research was sponsored by the U.S. Army Research Laboratory and the U.K. Ministry of Defense under Agreement Number W911NF-16-3-0001. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressed or implied, of the U.S. Army Research Laboratory, the U.S. Government, the U.K. Ministry of Defense or the U.K. Government. The U.S. and U.K. Governments are authorized to reproduce and distribute reprints for Government purposes notwithstanding any copyright notation hereon. <sup>b</sup>The Pennsylvania State University, <sup>c</sup>IBM T.J. Watson Research Center

## Abstract

We develop theoretical and analytical approaches to identify the conditions under which terrorist groups' choices over the locations of their targets converge. We focus on terrorism in India, a location relatively understudied and yet frequently targeted by extremist violence. Using social network analysis we find that Islamic terrorist groups in India (1990 to 2015) co-locate their targets in clusters, challenging a common view that terrorist incidents represent independent events. An analysis of terrorist target locations' two-mode centrality and cluster attributes creates a tool that can identify network patterns critical to terrorism dynamics.

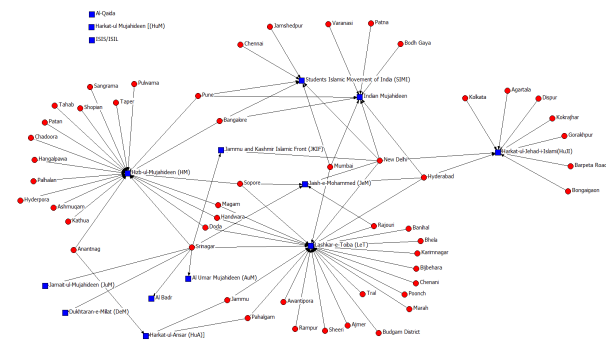
## Research Questions

- What are the most likely locations for terrorist attacks in India?
- Which are the most central, active, terrorist organizations in India?
- Do terrorist organizations and their targets group into subgroups?
- Can we develop a general tool for analyzing terrorism patterns?

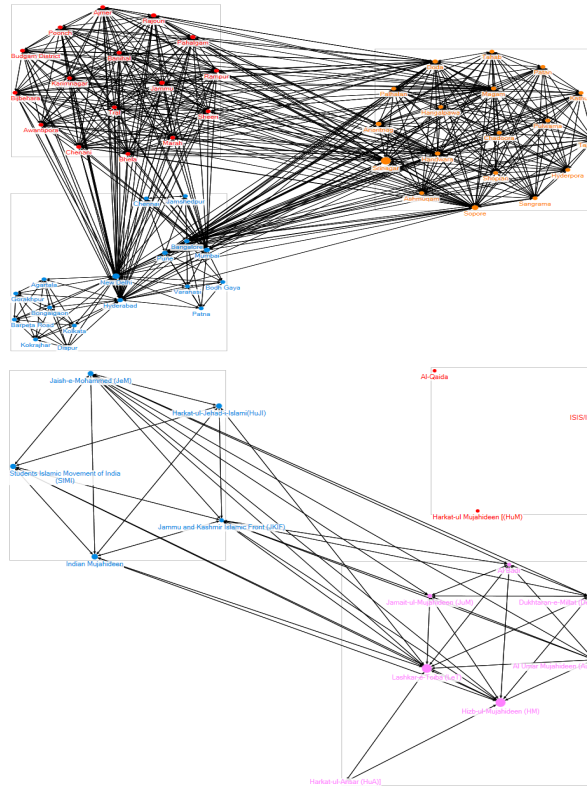
## Data & Methods

- Social Network Analysis
- Study Area: India
- Time Period: 1990-2015
- Sample of terrorist groups: 15 Islamist based terrorist groups in India
- Sample of locations attacked: 51
- Total number of terrorist events analyzed: 154
- Data Sources: Global Terrorism Database (GTD), and South Asian Terrorism Portal (SATP)
- Tie: Two terrorist groups are connected to each other if they both attacked in at least one common location together.

## Two-Mode Network



## Examples



2-Mode centrality Measures for Rows of Bombings sociomatrix SNA project

	1	2	3	4	5
	Degree	2-Local	Eigenvec	Closeness	between
1	0.067	0.012	0.022	0.449	0.000
2	0.067	0.031	0.138	0.558	0.000
3	0.133	0.030	0.102	0.558	0.013
4	0.067	0.026	0.084	0.612	0.000
5	0.067	0.031	0.138	0.612	0.000
6	0.200	0.044	0.161	0.612	0.000
7	0.067	0.031	0.138	0.612	0.000
8	0.067	0.031	0.138	0.612	0.000
9	0.067	0.031	0.138	0.612	0.000
10	0.067	0.031	0.138	0.612	0.000
11	0.067	0.031	0.138	0.612	0.000
12	0.067	0.031	0.138	0.612	0.000
13	0.067	0.031	0.138	0.612	0.000
14	0.067	0.026	0.089	0.542	0.000
15	0.067	0.031	0.138	0.612	0.000
16	0.067	0.031	0.138	0.612	0.000
17	0.067	0.031	0.138	0.612	0.000
18	0.067	0.031	0.138	0.612	0.000
19	0.067	0.031	0.138	0.612	0.000
20	0.067	0.031	0.138	0.612	0.000
21	0.067	0.031	0.138	0.612	0.000
22	0.067	0.031	0.138	0.612	0.000
23	0.067	0.031	0.138	0.612	0.000
24	0.067	0.031	0.138	0.612	0.000
25	0.067	0.031	0.138	0.612	0.000
26	0.067	0.031	0.138	0.612	0.000
27	0.067	0.031	0.138	0.612	0.000
28	0.067	0.031	0.138	0.612	0.000
29	0.067	0.031	0.138	0.612	0.000
30	0.067	0.031	0.138	0.612	0.000
31	0.067	0.031	0.138	0.612	0.000
32	0.200	0.050	0.202	0.676	0.032
33	0.067	0.031	0.138	0.612	0.000
34	0.133	0.033	0.111	0.627	0.011
35	0.067	0.031	0.138	0.612	0.000
36	0.067	0.031	0.138	0.612	0.000
37	0.067	0.031	0.138	0.612	0.000
38	0.067	0.031	0.138	0.612	0.000
39	0.067	0.031	0.138	0.612	0.000
40	0.200	0.050	0.202	0.676	0.032
41	0.133	0.038	0.180	0.618	0.000
42	0.067	0.031	0.138	0.612	0.000
43	0.067	0.031	0.138	0.612	0.000
44	0.067	0.031	0.138	0.612	0.000
45	0.067	0.031	0.138	0.612	0.000
46	0.067	0.031	0.138	0.612	0.000
47	0.200	0.064	0.268	0.742	0.046
48	0.067	0.031	0.138	0.612	0.000
49	0.067	0.031	0.138	0.612	0.000
50	0.067	0.031	0.138	0.612	0.000
51	0.067	0.031	0.138	0.612	0.000

## Results

	Degree	2-Local	Eigen	Between	Closeness	D-Rank	2-Rank	E-Rank	B-Rank	C-Rank
LeT	0.471	0.221	0.768	0.622	0.5	1	1	1	1	1
HM	0.392	0.154	0.493	0.523	0.381	2	2	2	2	2
HuJI	0.176	0.031	0.122	0.405	0.197	3	3	6	7	3
I Mujah	0.157	0.025	0.205	0.467	0.117	4	4	4	4	4
SIMI	0.118	0.014	0.152	0.457	0.075	5	5	5	5	5
JeM	0.098	0.01	0.234	0.473	0.039	6	6	3	3	6
JKIF	0.039	0.002	0.111	0.457	0.01	8	8	7	6	7
HuA	0.059	0.003	0.072	0.374	0.006	7	7	8	12	8
Al Badr	0.02	0	0.059	0.385	0	9	9	9	8	9
AUM	0.02	0	0.059	0.385	0	10	10	10	9	10
DeM	0.02	0	0.059	0.385	0	11	11	11	10	11
JuM	0.02	0	0.059	0.385	0	12	12	12	11	12
Al-Quaida	0	0	0	0	0	13	13	13	13	13
HuM	0	0	0	0	0	14	14	14	14	14
ISIL	0	0	0	0	0	15	15	15	15	15

## Conclusion

- Lashkar-e-Taiba (LeT) is the most active terrorist group.
- Srinagar and New Delhi are the most central targets.
  - Pakistan is close to both of these cities, especially Srinagar, which suggests that distance from Pakistan could affect the likelihood of a target location.
- Clustering seen among locations based on strategic importance. Most of the state capitals cluster together, due to their political significance.
- Clustering occurs among most of domestic and international terrorist groups.
- Al-Qaeda, Harakat ul-Mujahidin (HuM), and ISIS/ISIL: Three isolate international terrorist organizations in the data set have centrality scores of '0'.
- Other factors, such as ideology and goals, which link extremist groups and explain target choice, need to be included in future network studies.
- Network analyses provide early insights into the problem of terrorism in India.
- Two-factor centrality provides a general tool for analyzing terrorism patterns.

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