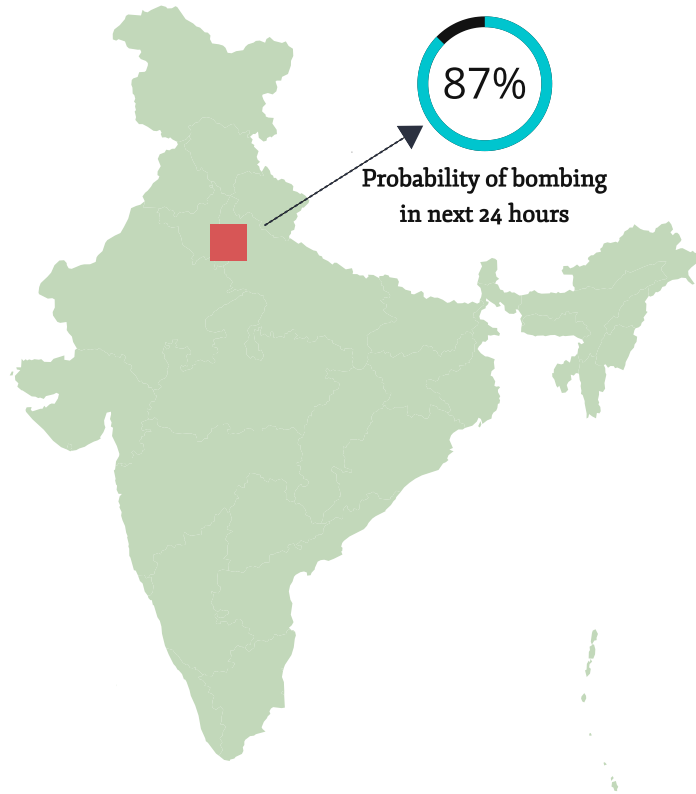


A black and white photograph of a war-torn street. The scene shows significant destruction with damaged buildings, rubble, and debris. The street is narrow, and the buildings on either side are in various states of ruin. The sky is clear and bright, casting shadows on the ground and buildings. The overall mood is somber and desolate.

MODELLING TERRORIST ACTIVITY

Santhosh Narayanan
Tuesday, June 7th 2022

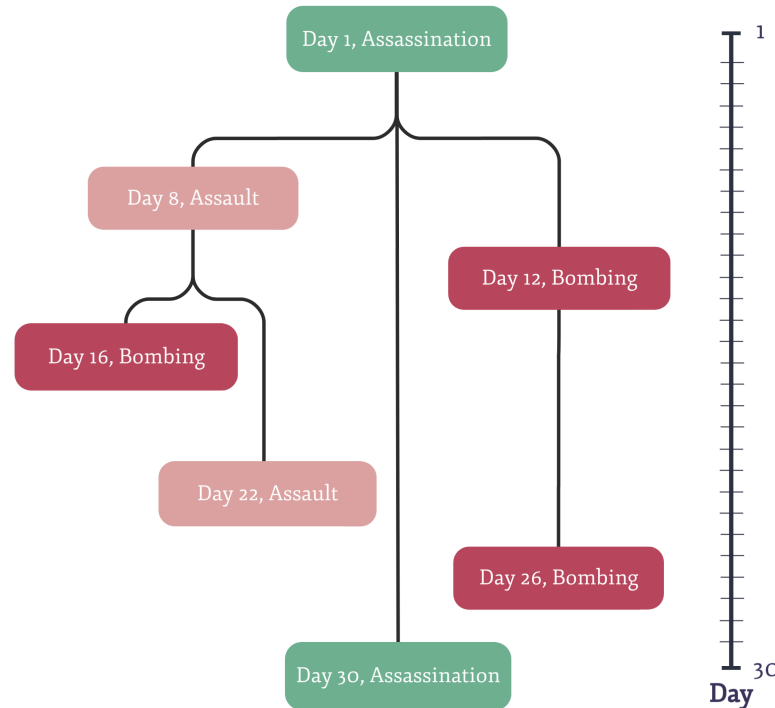
Highlights



1

Prediction

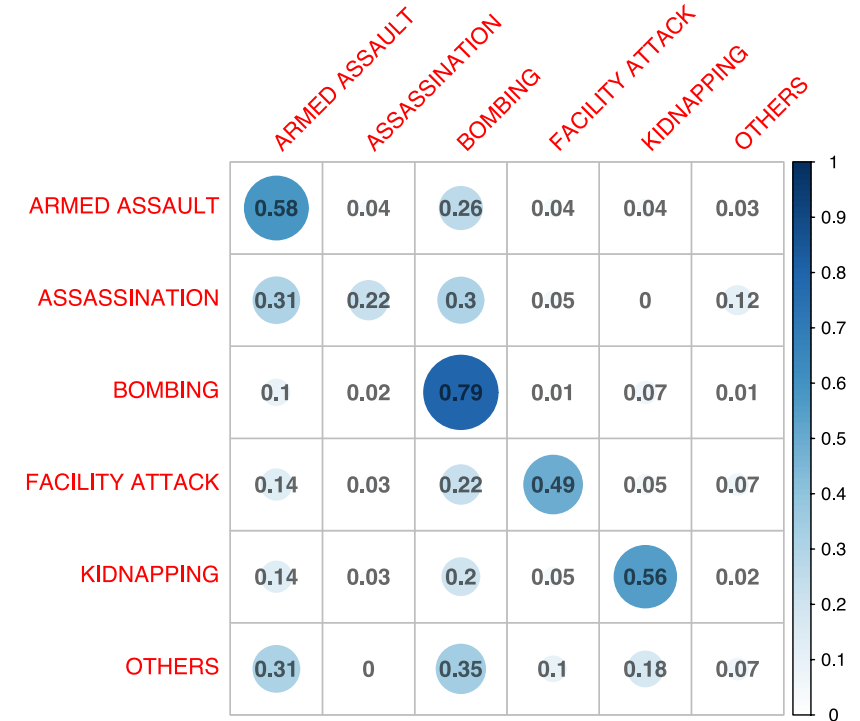
Obtain probabilistic predictions for specific events over any region and time horizon



2

Event genealogy

Identify causal relationships between events by recovering the hidden branching structure



3

Dynamics

Learn the triggering probabilities between different types of events and how they evolve over time and space

Takeaways



WHAT IS IT?

DTMSTPP is a statistical model that gives probabilistic predictions for the number of occurrences of specific events over any region and time horizon



DOES IT WORK?

DTMSTPP performed better than the TSGLM and Poisson models in all 7 scoring rules validating one-day ahead model predictions over a period of 3.5 years. Also had a higher Prediction Accuracy Index than the Hotspot Mapping technique over the same time period.



WHY IS IT UNIQUE?

DTMSTPP offers more than just predictions. The model provides insight into the dynamics of the underlying phenomena that generated the data. It can also identify causal relationships and hence discover connected events.

References

01

Time series generalised linear model (TSGLM)

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Czado, C., Gneiting, T., & Held, L. (2009). *Predictive model assessment for count data*. *Biometrics*, 65(4), 1254-1261.

03

Prediction Accuracy Index

Chainey, S., Tompson, L., & Uhlig, S. (2008). *The utility of hotspot mapping for predicting spatial patterns of crime*. *Security journal*, 21(1), 4-28.

04

Hotspot Mapping

Bowers, K. J., Johnson, S. D., & Pease, K. (2004). *Prospective hot-spotting: the future of crime mapping?*. *British journal of criminology*, 44(5), 641-658.

A lush green tea plantation landscape with rolling hills and misty mountains in the background. The tea bushes are arranged in neat, terraced rows. The sky is bright and hazy, suggesting a misty or early morning atmosphere. The overall color palette is dominated by various shades of green, from deep forest green to bright, almost white highlights from the mist and sky.

Thank You

Santhosh Narayanan



+91 85906 76703



stats.santhosh@gmail.com