

# Crime detection and crime hot spot prediction using a deep learning model

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Crime is an age-old and never-ending problem for societies worldwide and crime detection and crime fighting have always chased after the criminals who often stay one step ahead.

Research [published](#) in the *International Journal of Knowledge-Based Development* has turned to emotional data alongside machine learning (ML) and [deep learning](#) (DL) techniques to develop technology that might one day help us better understand the criminal mind and perhaps even predict criminal activity so that it might be prevented.

A. Kalai Selvan and N. Sivakumaran of the Department of Instrumentation and Control Engineering & Head at the National Institute of Technology, in Tiruchirappalli, Tamil Nadu, India had two main objectives: the prediction of crime using ML models based on emotional data and the identification of future crime hotspots using DL methods applied to crime incident data.

By analyzing voice-based [emotional cues](#) using ML algorithms, the team has achieved a detection accuracy of 97.2% for various crimes. Additionally, DL techniques, particularly convolutional stacked bidirectional long [short-term memory](#) (LSTM), allowed them to detect crime hotspots with an accuracy of 95.64%.

The researchers point out how the significance of emotional states in [speech patterns](#) allowed them to explore speech-based emotion detection. They took into account linguistic origin, paralinguistic cues, and the characteristics of the speaker. This allowed them to integrate the emotional data they obtained with other factors such as location and the type of crime that takes place in a hotspot.

While the notion sounds rather futuristic, the rapid advances in algorithms that can extract and identify patterns in data is in no way a matter only for science fiction. The team says that their approach could monitor activity in crime hotspots, detect crimes, and forecast future criminal activities.

Future work might allow similar machine learning techniques to be used

for emergency response systems, rather than only in crime fighting. By analyzing the emotional content of a person calling the [emergency services](#), the system might be able to distinguish between genuine emergencies and non-emergency or even fraudulent calls, which could reduce the burden on the services considerably. It is only a matter of time before the research takes the prediction accuracy closer and closer to the ideal 100% of the ultimate [crime](#)-fighting AI emotion detector.

**More information:** A. Kalai Selvan et al, Crime detection and crime hot spot prediction using the BI-LSTM deep learning model, *International Journal of Knowledge-Based Development* (2024). [DOI: 10.1504/IJKBD.2024.137600](#)

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