US police testing AI that learns to spot crimes in CCTV footage

Just like humans, machines can be trained to spot illicit activity
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By **Richard Kemeny**

SURVEILLANCE cameras are already ubiquitous, but you still need trained guards to spot crime. Keeping that level of attention up can be hard, even for the most focused individual.

Now police in Orlando, Florida, have been testing a system that automatically scans CCTV looking for potentially illicit activity.

Previous AIs have been trained to spot specific activities, such as violence. Yet as crime comes in many forms, these systems are inherently limited. Waqas Sultani at the Information Technology University in Pakistan and his colleagues tried to incorporate a more holistic approach to crime.

The team uses a form of deep learning, where AI analyses separately labelled data sets and then tries to spot distinguishing patterns. The idea is that by finding a way to identify criminal activity in general, the system should be better at interpreting previously unseen crimes.

To train the AI, it was fed 800 run-of-the-mill videos from YouTube, LiveLeak and the Orlando police department, and 810 of "anomalous activity", including vandalism, fighting, arson, robbery and an explosion. Then it got to work, analysing patterns in motion and colour to find out why some videos showed crimes and others didn't.

The system was then tested on 150 normal videos and 140 showing a crime. It created a probability ranking system for criminal activity in segments of the videos. When this number exceeded a threshold, it would flag it up as a possible crime.

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The results were promising: the AI correctly identified 75 per cent of crimes and could pick out segments of the video where the criminal activity took place. The researchers then tested it on videos showing crimes it wasn't trained on, such as mobile-phone snatching. Here, the accuracy was about 73 per cent. The paper was presented at a computer vision conference in Salt Lake City, Utah.

There were limitations to the system too. False alarms were triggered less often than a handful of competitor AIs tested on the same videos, but they still happened: people gathering to watch a relay race were judged to be lawbreakers, for example. Orlando police say they do not plan to roll the system out for real.

There are broader concerns with the implementation of an automated surveillance system. "With the advent of this kind of AI monitoring, the whole network of cameras is in some important sense waking up," says Jay Stanley at the American Civil Liberties Union. "Everybody is going to be monitoring themselves and feeling watched in a way that they don't currently with today's cameras."

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