THE UNIVERSITY of EDINBURGH

News Release

Issued: Thursday 9 November 2017

TV crime box sets give computers a lead in solving problems

Computers are being trained to solve problems by bingeing on episodes of a popular TV crime drama.

Artificially intelligent machines have been trained to study the hit show CSI, and identify the perpetrator in each case.

The study was aimed at enabling machines to solve a problem – in this case identifying a fictional killer – by assimilating information from images, audio, transcribed dialogue and scene descriptions.

The researchers studied if and how artificially intelligent machines can solve problems that are challenging for humans. The computer model processed data in various forms – spoken, visual or textual – as the plot of each episode developed.

Scientists designed their computer model to solve arbitrary problems based on acquiring data. Such devices could play a role in developing efficient algorithms for real-world tasks that require complex reasoning, researchers say.

Scientists from the University of Edinburgh mapped footage, script and background sounds from five seasons of the show into a machine-readable format. The data was fed into a computer model that learned to process the plot as each episode unfolded, continually revising the criminal's identity.

The computer correctly identified the perpetrator during the final part of an episode 60 per cent of the time. People who watched the same shows were able to identify who was responsible 85 per cent of the time, the study found.

The American series Crime Scene Investigation, or CSI, began in 2000 and ran for 15 seasons. Scientists taught machines to approach solving the crimes in the same way that people would – by considering which characters might be responsible from their behaviour as the plot unfolds.

The study, published in *Transactions of the Association for Computational Linguistics*, was funded by the European Research Council and H2020.

Dr Lea Frermann, from the University of Edinburgh's School of Informatics, said: "Pinpointing the perpetrator in a TV show is a very difficult task for computers, but our model performed encouragingly well. We hope our findings will aid the development of

machines that can take on board – and make sense of – large streams of information in real time."

For further information, please contact:
Catriona Kelly, Press & PR Office, tel 0131 651 4401, email Catriona.Kelly@ed.ac.uk