Machines could learn to listen out for dangerous sounds.

A machine that learns by listening

Online videos play a huge part in our lives, with some YouTube efforts racking up millions of views in a single day. You might watch videos to get top tips about gaming, follow a recipe or simply to laugh at cats with funny faces. Now, a team of computer scientists from the Massachusetts Institute of Technology (MIT) have found a new use for this online entertainment. A computer called SoundNet has learned how to distinguish between different sounds by binge-watching a year's worth of videos.

While computers are already quite good at looking at objects and distinguishing between them, a lot of computers can't tell the difference between sounds. Yusuf Aytar and his team set out to solve this problem. They began by downloading two million popular videos with a total running time of over a year.

The team chose videos that involved natural situations and that had not been professionally edited. This was so the computer could learn from what it saw and heard, a bit like babies do. The videos included babies babbling, people cheering, birds chirping and bubbles under water.

It took around a day for the computer to get through them. The computer was able to watch the videos at high speed, first detecting and identifying the objects in each shot, and then matching the sound to the objects. By the end of the viewing marathon, the computer could distinguish between sounds like bird chirps, snoring and fireworks.

When the computer had watched all the videos, the researchers decided to test it. It was asked to sort between sounds such as rain, sneezes, a ticking clock and roosters. The computer was 92.2 per cent accurate in its hearing test. Humans scored 95.7 per cent on the same test.

The team is hoping that this new breakthrough will allow people to speak to machines in a more natural way. In the future this work could also help protect homes with home-security systems able to listen out for noises such as a window shattering or a smoke alarm, and work out what's happening.

DID YOU KNOW? There were some sounds that the computer had trouble recognising. It mistook footsteps for door knocks and the sound of insects for a washing machine.

Marvellous machines

Machines are capable of doing incredible things, from solving puzzles to performing surgery. Here are a few ways in which technology has made our lives easier.

Robo-surgeons

A remarkable robotic surgeon, called Axsis, has performed surgery on a human eye with greater accuracy than a person could ever achieve. The procedure is cataract surgery and it is an extremely delicate operation. Cataracts occur when the lens in the eye becomes cloudy, making it difficult for sufferers to see. Surgeons need to cut small holes in the lens and scoop out the cloudy bit to restore a patient's sight. Axsis is steadier than a human hand and can be made to move exactly where the surgeon requires.

Virtual assistants

Amazon Echo's virtual assistant, Alexa, is capable of performing more than 3,000 different tasks. Some of Alexa's skills include: streaming music on command, hosting a quiz night, turning lights on and off and even ordering a pizza. Alexa uses voice-recognition technology and Wi-Fi to connect to the internet to perform its tasks.

Puzzle solvers

A robot from Germany has solved a Rubik's cube in just 0.637 seconds – shaving 30% off the previous record time. The stunt was to show that robots could make quick decisions, which could save lives.