

GCSE Bitesize Computer Science

Andrew Robison on Raspberry Pi – transcript

For Springwatch, we put a Raspberry Pi in a bird box in a field and that allowed us to detect bird activity. So what we did, we had an optical sensor just outside the nest box and one just inside the nest box and had an infrared beam, which broke when the birds flew through it.

By having the two sensors – one on the outside and one on the inside - by seeing which one breaks first, we could see if birds fly in or fly out. So from that information, we're able to plot bird activity and also see how long they spend in and out of the nest. We also had a weather station that was recording data like temperature, humidity, wind speed, and we could then combine that data with the bird activity data and we could see whether birds were more active or less active as it got hotter or if it got windier. So from that we actually managed to discover new things about bird activity, just by recording this data with a computer.

So we were able to detect whether the birds were flying in or out, and that would record the data. And then we wanted to look at that data from elsewhere, so we had a 3G USB dongle which then connected via the mobile phone network to the internet, and so we were able to see the bird activity from anywhere in the world. In fact, I was able to see when the chicks left the nest because the activity changed and I was able to detect that from a few hundred miles away. It was a two-way link, so we were able to actually upgrade our program part way through it, and so we could connect to the Raspberry Pi from the computer at home and then change the code on it so it would detect more things.

Raspberry Pis are really great because you can put them where you wouldn't normally put a computer. They're a lot lower power, they're lower cost and they're a lot smaller, so in our case we were able to put it right in a bird box in the middle of a field. You couldn't do that with a desktop. Some of the things we used Raspberry Pi to do as well is, like a robot, so you can put a little robot and then put the Raspberry Pi on it, and the Raspberry Pi controls the outputs, it controls the motors or it drives around. It's also connected to a camera so then you can use the camera to recognise things. So maybe you can give it a shape and the robot would then follow round that shape, or it could detect where a bright-coloured ball was and then follow the ball.