Behavioural assessment tool aims to give voice to animals

report by
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THE way vets analyse animal behaviour could be revolutionised thanks to a piece of computer technology that will assess what animals are thinking and feeling.

A software program called the Horse Automated Behaviour Identification Tool (HABIT) will assess amateur video footage to identify behaviour. It has the potential to support the diagnostic process and inform the selection of treatment, or recommended changes to welfare and management.

The emerging scientific discipline of animal-computer interaction (ACI) looks at the relationship between animals and technology. Human-computer interaction is well-established.

Steve North, a research fellow in the mixed reality laboratory (MRL) at the University of Nottingham, is developing the software, which he hopes will be able to be used in research settings, farms, zoos, practices and at home. The project is initially focusing on horses, but it may be used to assess other animals in the future.

"This project is important because horses are unable to vocalise for themselves what behavioural problems they may be experiencing," Dr North said.

"Hopefully, vets, vet nurses, owners and researchers will be able to use this tool to analyse and learn more about horse behaviour generally."

Team challenges

One of the challenges for the team is existing video-based behaviour identification technology has mainly been used in controlled environments, such as filming animals in a pen, meaning the background does not change, making it easier to spot behaviours and movements.

Dr North said: "Initially, we may not be able to just point a device at a horse in a field and have the software tell us right away what the animal's behaviour is. Obviously, that is a highly desirable outcome, but it exceeds our initial focus.

"We are working towards recording video 'in the field' and taking it away for processing."

However, once the tool is fully developed, it is hoped vets and owners will be able to film animals in their own, unconstrained environment, process the video on an "off-the-shelf" computer and see an assessment on-screen.

"It has the potential to revolutionise the way vets analyse animal behaviour, but I want to make it clear we are at a research level at the moment," Dr North said.

"Within two years, we would hope to be evaluating it, publishing papers and have a working prototype, but we are probably looking at five years before vets would actually be seeing a product they could use."

Developing ideas

The project received initial funding from the MRL in the School of Computer Science for an engineering and physical sciences research council (EPSRC) exploratory project to develop ideas and bring together an interdisciplinary team of experts.

The EPSRC grant is used by the MRL to develop ideas under the heading "interleaving the physical and the digital for everyday life".

The team consists of Mandy Roshier, an anatomy and behaviour expert at the university's School of Veterinary Medicine and Science; Carol Hall, an expert in equitation science at Nottingham Trent University; and Clara Mancini, a senior lecturer in computer interaction design and head of the animal computer interaction lab at The Open University.

Dr Hall and Dr Roshier have published an article considering the challenges involved in measuring and interpreting animal behaviour, entitled "Getting the measure of behaviour – is seeing believing?", which featured in the July-August edition of *Interactions'* special section on ACI (edited by Dr Mancini and Dr North).

Improve understanding

Dr Hall said the project had the potential to speed up the process of behavioural analysis and increase the objectivity and accuracy of recording behaviour. However, according to Dr Roshier, more work needs to be done to improve understanding of animal behaviour, particularly animal communication.

"The evidence base is growing and there is interest, but this is an approach where you look at the whole animal in unconstrained situations. Getting that on video and using a computer tool to help make the interpretation is a unique approach to assessment," she said.

Existing behavioural assessment measures are based on human judgement, which can lead to error, she explained.

"A tool that can look at the whole animal will bring so much more information to us," added Dr Roshier.

"Computers can take a large amount of data and sift through it, finding patterns and meanings maybe the human eye might miss.

"Those interactions are more successful if vets are able to interpret the animal and respond appropriately. So, understanding the animal's emotional state should then affect how you handle them, making the experience better for the animal and person, from a safety perspective as well."

To watch a video about the HABIT project, visit http://bit.ly/29WPwul