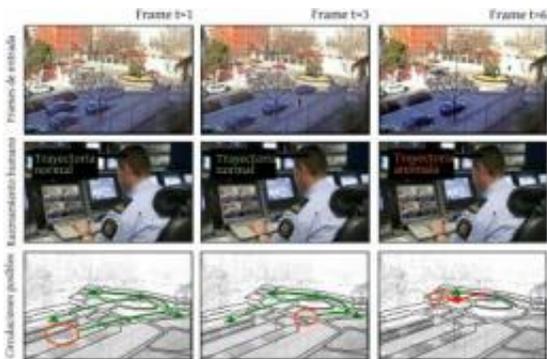


Pedestrian crossings could be monitored

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This is a comparison between the reasoning models of the artificial system and that of a theoretical human monitor in a traffic-based setting. Credit: ORETO research group / SINC

A team of researchers from the University of Castilla-La Mancha (Spain) has developed an intelligent surveillance system able to detect aberrant behaviour by drivers and people on foot crossing pedestrian crossings and in other urban settings. The study, published this month in the journal *Expert Systems with Applications*, could be used to penalise incorrect behaviour.

"We have developed an intelligence surveillance software and related theoretical model in order to define 'normality' in any setting one wishes to monitor, such as a traffic scenario", David Vallejo, from the ORETO Applied Intelligent Systems research group of the UCLM and co-author of a study published in the latest issue of *Expert Systems with Applications*, tells SINC.

The study focused on a pedestrian crossing in a two-way street, regulated by a traffic Light. The authors defined 'normal' behaviour of cars and pedestrians in this setting, in which they can move when the lights are green, but must stop and not cross the safety lines when the lights are red.

The system, working in a similar way to a human monitor, can detect whether the vehicles and pedestrians are moving "normally". If at any point any of the movements related to these "objects" is not 'normal' (driving through a red light, for example), the programme recognizes that the behaviour differs from the normal framework established.



The OCULUS monitoring tool used to analyze the behavior of vehicles and pedestrians within a traffic-based setting. Credit: ORETO research group / SINC

The supporting architecture underlying the model is a multi-agent artificial intelligence system (made up of software agents that carry out the various tasks involved in monitoring the environment. It has been designed according to standards recommended by the FIPA (Foundation for Intelligent Physical Agents), an international committee working to promote the adoption and diffusion of this kind of technology.

In order to prove the effectiveness of the model, its creators have developed a monitoring tool (OCULUS), which analyses images taken from a real setting. In order to do this, the team members placed a video

camera close to their place of work, the Higher School of Information Technology in Ciudad Real.

"In this way we are able to identify any drivers and pedestrians behaving abnormally, meaning the programme could be used in order to penalise such behaviours", says David Vallejo.

The researchers are continuing their work to fine tune the system, and believe it will be possible to use it in future in other situations, for example in analysing behaviour within indoor environments (museums, for example), or in detecting overcrowding.

Source: FECYT - Spanish Foundation for Science and Technology

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