Who are the aggressive stars of CCTV?

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A computer program can analyze CCTV images and spot aggressive human behaviour nine times out of ten, according to research published in the International Journal of Computational Vision and Robotics. The research is an important step forward in intelligent security systems that could raise an alarm without requiring constant human vigilance.

Image-processing experts Abdelhak Ouanane and Amina Serir of the Université des Sciences et de la Technologie Houari Boumediene in Algiers, Algeria, used a geometrical analysis of images to create a silhouette of a person on the screen. The system then maps the movements of the person's limbs, the team then correlates those movements with aggressive and passive behaviour so that the algorithm learns what particular changes in geometry are associated with aggression. The program can automatically distinguish between hand clapping, waving and a punch being thrown, for instance. The system can also discern whether a person is walking, jogging or running. The resulting algorithm has 90 percent accuracy, compared with other systems the best of which is around 80 percent accurate. On a standard data set the accuracy is as high as 98 percent whereas the best alternative is 95 percent.

The team points out that the algorithm is robust and not susceptible to changes in lighting conditions and noise in the images. This allows it to work well in a variety of indoor and outdoor settings, street, airport, sports stadium etc. Moreover, the simplification of the images to human silhouettes reduces the computational overhead significantly and allows the analysis to be carried out quickly without the need for a high-

performance computer.

With increasing numbers of CCTV cameras monitoring people in city centres as part of crime-reduction efforts, technology that can automate the process of spotting aggressive behaviour without increasing numbers of people to monitor the video streams is becoming more and more important.

More information: Ouanane, A. and Serir, A. (2014) 'An improved geometric descriptor associated with wavelet transform for aggressive human behaviour recognition', *Int. J. Computational Vision and Robotics*, Vol. 4, No. 3, pp.171–194

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