OT-05

Application of computer vision technologies for behaviour monitoring

ULPGC Universidad de Las Palmas de Gran Canaria | Fundación Parque Científico Tecnológico | OTRI Oficina de Transferencia de Resultados de Investigación

TYPE OF RESULT

New technology
New product
New service
[**New knowledge or skill**]

COMMERCIAL MATURITY LEVEL

Conceptual idea
Proof of concept (design)
[**Validated in a controlled environment**]
Validated in a real environment
Successfully implanted

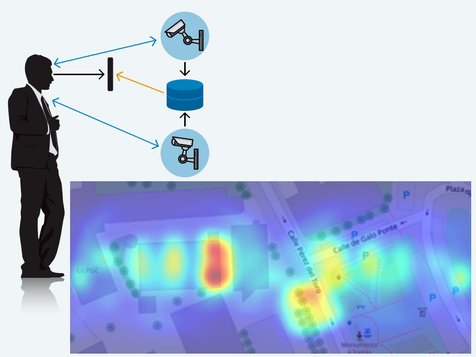
PROTECTION LEVEL

Non- applicable
Patent
[**Software**]
Know - how
Utility model

Technology description

Computer vision consists of processing and analysing real images in order to recognise patterns that make easier or automate decision making. Such images are mainly obtained from video cameras.

The system here proposed integrates our own developed and third-party mathematical algorithms. It is aimed at detection and monitoring of practically any kind of entity (both people and animals) by analysing the video images. Such images are recognised via biometric characterisation parameters, allowing, this way, to create a unique "digital identity", in order to monitor its behaviour in real time with a very high precision in controlled environments. Thanks to its fast implementation in smart devices, biometric technology has reached a high level of maturity, which supports the establishment of behavioural patterns that, after being interpreted, offer a valuable information.



Although these technologies offer a wide range of possibilities for automated behaviour monitoring applied to a commercial context, integration of artificial intelligence and recollection of biometric data allow to describe both groups and subgroups habits (classified according age or sex), as well as specific individuals. This may be very useful for determine global and categorised demands of space use in order to adapt the commercial environment to specific client profiles.

This system is particularly designed for enclosed spaces, where video surveillance equipment or cameras are available for getting good resolution images from most of the facility. Personal parameters of the individual (such as sex, skin colour, age group, etc.), which are based on morphological and biometric features are not associated to any personal database; therefore, individual's identity is dissociated from such features, complying with the LOPD-GDD (Spanish Organic Law on Protection of Personal Data and Guarantee of Digital Rights).

The solution to be transferred consists of a monitoring system based on computer vision technologies, technical support and consulting services for selecting technologies to be integrated, as well as adaptation, implementation and deployment of the system where is going to be applied.

Fields of application

This system offers many applications, especially those associated to commercial activity and user experiences, where knowledge about the behaviour of the users/customers in real time can provide many relevant information that allows to adapt the product or service according to preferences.

In this sense, the system provides information about the individual's behaviour in an enclosed space in terms of time spent in a specific place, attention on elements of interest, frequency by a particular location, etc.

This technology may be of interest for the following sectors: retail stores, leisure sector or hotel and catering industry, since all of them have in common their need to segment customers in order to adapt their product and services according to the particular needs of said customers, as well as to improve their purchase experience.

Also, security sector may be particularly interested in this technology offer, since it provides valuable information that can be used to foresee possible risks and offending behaviours.

Market opportunity / needs

Analysing customer interests and feelings about consuming certain products or services help the companies to adapt their offer and significantly improve each user's experience.

This contributes to the development of biometric marketing strategies, which can trace even more complex behavioural maps and, at the same time, more success in campaign design is achieved.

In traditional commerce, knowing the customer's behaviour in the context of the business space is vital for optimising space and product placement in shelves.

Competitive advantage and innovative aspects

Several technologies for analysing customers' movements in monitored spaces are available; like, for example, tracing heat maps, which are based on the triangulation of a signal emitted by a device such a mobile phone in order to get the position of a client.

Unlike other solutions and technologies, the system here proposed takes advantage of the existing infrastructure (video surveillance equipment already installed in the facility) and, therefore, it does not require a major investment in equipment.

Resources needed to be implemented

Although the system is developed, its implementation in real environments requires a specific project for being adapted to each client's needs, as well as the features of the environment of application and the necessary "training" of the system in order to optimise it.

This way, the development of any solution requires previous images from the environment of application, so at least a camera in each area to be monitored is needed.

Regarding to deployment, it is necessary a computer equipment having a minimum 16GB RAM, a 1Tb SSD disk and at least a 10th generation i7 processor. These requirements would be increased depending on the number of spaces and volume of people to be monitored simultaneously.

Related equipment

The research group can provide training for adapting the classification models to the particular observation scenario.

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