

INTELLIGENT IMAGING TECHNOLOGY IMPLEMENTATION AS TERRORISM PREVENTION IN RETAIL SECTORS IN 21st CENTURY

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INTELLIGENT IMAGING TECHNOLOGY IMPLEMENTATION AS TERRORISM PREVENTION IN RETAIL SECTORS IN 21ST CENTURY

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Abstract

Terrorism is a very dangerous thing and has become a threat both on a national and international scale. Understanding terrorism seeks to instill the seeds of hostility towards a group, government agencies and even the state. Before entering the 21st century terror attacks are blatant in the business sector by sabotaging and damaging public facilities and vital objects. These physical attacks can be prevented by recording personal identities or conducting regular security patrols and placing a large number of security personnel in places of business and places that are considered strategic. However, this is still not optimal where the level of security and the number of personnel are limited in monitoring the place for a long time and are sustainable. The terrorist attacks in the 21st century are different and require different handling. Attacks can be physical or non-physical. On non-physical objects attacks are usually carried out by hacking networks that can damage internet network connections in one area and even one country. Ways to prevent attacks that are physical in nature by utilizing computer vision technology capabilities that are used to record all civil society. An additional feature in this technology lies in the face recognition and pattern matching techniques where a person's face will be searched for unique features. Then from these data will be biometric data, namely data that will not change and disappear. Computer vision algorithms can detect a person's face or object even though it has been modified or changed in physical and color conditions. The advantages of these algorithms are effectively used to record visitor identities and are optimal in recognizing an object with an accuracy of up to 90%. This system is able to help and improve a security feature of a business and tourist area.

Keywords: 21st Century, Computer Vision, Intelligent Imaging, Retail Sectors, Terrorism.

INTRODUCTION

This terrorist attack in the 21st century has changed which was originally carried out openly which attacked government agencies and vital objects. The attack serves to reduce morale and disrupt an economic order as a result the security system is chaotic and causes a crisis of trust in the government. The attack could be used to overthrow a legitimate and politically charged government. Before 21st century terrorists were easily identified because they were in groups and in very large numbers. After the 21st century terrorist attacks turned into smaller groups and targeted no longer the government but business areas and places and tourism.

Their numbers are small but have high damage. The attack can be through destruction of hardware or software installed in the business area. This happened because of the target because it was considered to have a weak security level unlike government agencies. These attacks can cause victims and more damage. Businessmen in the business sector are aware of this by initiative to increase the level of security and increase the amount of security and install security cameras or CCTV, but the system has not been fully able to overcome the security problems caused by limited operating time and hours and the fatigue factor of the

officer. Security officers must monitor for 24 hours and sometimes these conditions are used by terrorists to carry out attacks.

The solution to this problem is to create a surveillance system that is integrated with government security data with the help of a modern computer. Assistance to security systems with computers has been implemented in several developed countries. The technique is Computer vision, a technology that allows a computer to recognize an object or object known as "Recognition system". The technology has been implemented in various fields including health, industry, defense, and agriculture.

In this study computer vision technology will be implemented to support the security system to become a sector in the business area with the help of a camera which is generally installed as a surveillance camera. This system works with image processing technical methods by recording all endings in places of business or tourism virtually. The data taken is in the area of the visitor's face with face recognition techniques. The visitor's data and photos are then stored in a database through a server. The server data here should be integrated with government data and population where face features are compared to existing data. This supervision will be automatic and not

realized by visitors so that it will not interfere with the good activities of visitors at the cafe or other tourist attractions. This system will provide a response and supervision in an integrated and distributed manner so that it helps security tasks and adds security and comfort not only visitors to a business place or tourist area and can work for 24 hours. Every data taken will be stored automatically in the database and can be used as a visitor report.

BASIS OF THEORY

Information and technology

The development of information technology has developed very rapidly for 2 decades and has become a change in the times. The advancement of IT adds to the rapid transmission of data and data storage capacity, data becomes more mobile or easy to use and can be integrated with each other. On a broader scale IT development must be balanced with additional features and supporting data security. This is strongly influenced by economic conditions and computer networks and the infrastructure used. Infrastructure equipped with IT security networks will be a target of attacks where the issue of international terrorist networks has become a global issue and challenge. This phenomenon will be a major factor in the use of more advanced IT technology which will later be

used as a decision-making tool and ensure state security [1].

Terrorism

Terrorism itself is nothing new. Terrorism in 21 century has changed, previously carried out guerrilla. The theory of modern guerrilla was first discussed by Mao Tse-Tung. The theory was later adopted by the military to carry out attacks due to limited forces and other resources. Likewise the case with international terrorism has used technological assistance and no longer carried out guerrilla attacks [2].

Terrorism attacks when they can be online or digitally. The attack mostly occurred in the countries of the United Arab Emirates and several European Union member countries. Continuous attacks encourage industries in some countries to develop a tool and develop new technologies to prevent a continuous attack of terrorism. This system must be implemented immediately in accordance with the recommendations at the European country session on 28 June 2018. [3]

Deep machine learning

For decades machine learning technology was used to input raw data. Machine learning technology can be used to recognize a pattern, where the pattern

can be taken from a raw data input from the pixel value of an image. Then the image will be displayed again in a vector value which is then used to classify an object. [4]

Deep learning technology has several advantages that can be used to solve problems. This technology has been combined with artificial intelligence technology. Applied technology can be applied with many disciplines, for example in the fields of business and government. The system works with pattern recognition, image recognition, and voice recognition or sound-based systems. [5]

Since 2000 deep learning technology has been used and implemented to detect an image object or what is called edge detection. This method provides an automatic labeling system for these objects and is applied to regulate and recognize traffic signs. [6]

Image processing

The application of the computer vision method to a camera is to capture images that have a very small resolution that can be ascertained that the image has more than one number of objects. The next method is the addition of a thresholding method that is used to sharpen the image taken and reduce the amount of noise. The image data will be compared with the data

in the dataset. The process works is to compare two data taken on the database image that is on the server. [7]

Computer vision

1 Computer vision is a branch of computer science that functions how to retrieve useful information from an image. Information taken can be in the form of a model, display visualization, navigation process, pattern recognition or recognition that is surveillance.

Information in the form of video becomes a very important component that can be used as a decision-making process. This decision can be in the form of actions and prevention carried out to improve the security system. One of the features used is face pattern recognition or face recognition. [8]

The face detection system is currently the process of recognizing biometric data and has a high accuracy value. For decades Computer vision methods have taken the attention of researchers implemented in the fields of security, psychology, processing. [9]

RESEARCH METHOD

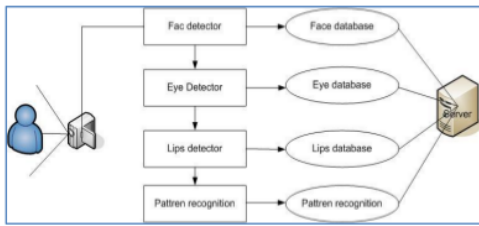


Fig 1.1 System test results.

The technique of implementing intelligent imaging requires the support of hardware and supporting software. The system is connected to the internet network on a server. The server functions as a place to store data in the form of data images from people who have been previously registered or image data that is random or taken randomly.

- Face recognition algorithms are a method and technique in computer vision to read and recognize an area of the face. This algorithm reading system can be real-time or read images that have been stored before. Face data taken from an output in the form of a camera or CCTV is then taken randomly. Data in the form of images taken in different positions and locations will be taken only from the face. The data is then stored in the database and compared with the training data on the server. If there is a criminal track record, the system will give a response in the form of a warning to police officers or business owners.


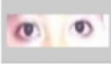

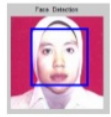




- The second method is taking a biometric data taken on face data. The system will automatically take features in the eye area. The data is then changed and compared to the eye recognition system. This system is useful if face data is not recognized by the system so the area of the eye that will be compared by the system.

- In the third part is a pattern matching technique or template matching. This technique is used to recognize facial features that have undergone many changes. For example, these changes are starting from haircuts, the use of eyeglass lenses and clothing worn. This algorithm is able to recognize and compare it with the original pattern. This pattern of introducing template matching will vary in each person and can be implemented to recognize other objects as examples of luggage, vehicle types and building objects.

RESULT AND DISCUSSION

System trial was used to test a pattern of data taken from photo objects and video cameras. Data input can be taken from a CCTV camera that is spread in business centers or in government agencies.

Table 1.1 Testing the intelligent imaging system.

Original image	Computer vision	Information
		The first method is a trial process using computer vision algorithms. Test data retrieving data from images automatically separates eye objects. Everyone's eye data is very unique and different. Data is then stored on the server and converted into matrix code as the person's identity.
		The second method is processing data using computer vision methods where the computer will automatically scan the face object and save it in a database. This system is called the face recognition feature; this system is very useful for detecting people in large numbers or in crowds.
		The third feature is the introduction of the features and shape of the nose and mouth, where the data taken has unique properties, due to the data of people's smiles and their unique tooth shape. This data can be used for processing forensic data.
		The fourth feature is processing data by taking all the features or characteristics of existing data from the start of the face shape, color of clothing

		and other unique properties. Each feature will be stored on a server as someone's identity data.
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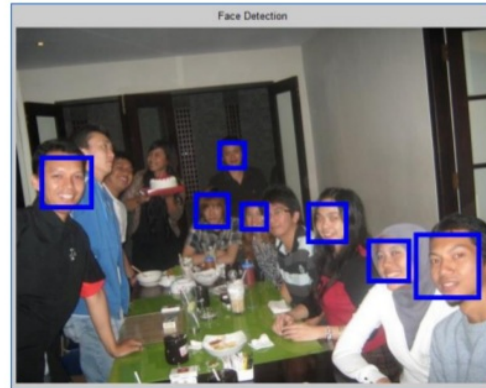


Fig 1.2 Pattern recognition system on café visitors.

In Figure 1.2 is the process of implementing intelligent imaging technology in café visitors. This system will read data automatically on facial features. Data then unknown to the café visitor will be stored directly in a database and converted into digital numbers in binary form.

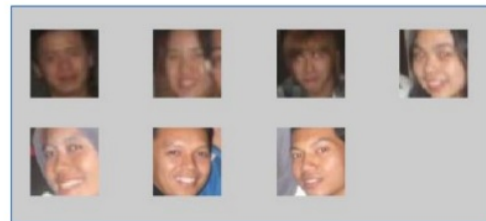


Fig 1.3 Face data store in the database.

In Figure 1.3 the process of storing data on visitors to the café and stored in the database for later use. The internet imaging system will automatically retrieve on the server. Data on the server will read automatically every time the person ends at a café or other place.

CONCLUSION

Intelligent imaging implementation can be implemented to improve a security system in the business sector. This system does not replace the role of security officers but as a tool to prevent unexpected attacks by irresponsible parties. This security system will provide additional security for visitors and managers of business premises, whether it is a café, restaurant or hotel. An integrated system allows data sharing with a combination of other security systems because it is integrated with a server.

Suggestions for further research are the existence of maintenance and maintenance process in terms of hardware or software so that the system can be used for a long time. To add security features and a fast response must be made a distributed data access system with the sharing of data with the relevant security parties so that an emergency situation will be responded quickly either by the business manager or security officer.

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