MOBILE TO SERVER FACE RECOGNITION:
A PROPOSED SYSTEM FOR SOCIAL SITUATIONS IN MALAYSIA

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Abstract: This paper proposes a new solution to provide an alternative to help remedy the current social situations, or to be more specific, in Malaysia. Justifications of real crime cases are presented in this paper along with an overview of the proposed application for further readings. The crime cases are included in this paper to justify the rationale of the proposed application. Current preventions or actions taken by the authorities are also included with the relevance of the discussed cases. As the result, an application known as Mobile to Server Face Recognition is proposed to provide another method to deter social situations for the society in the most convenient way.

Key-Words: Social situations, Justification, Mobile to server face recognition

1. INTRODUCTION

Malaysia is shocked with terrible and horrifying news that strike nationwide. Local news is being dominated with news of robberies, kidnappings, rapes, domestic violence, frauds, illegal immigrants and the most atrocious is brutal murders. “A murdered and burnt body was found”, “A housewife was killed by a robber”, “7 years old kid went missing for a week” – these are some of the frightening headlines of our local news these days.

In this paper, three major situations are taken into consideration, which are the rape and murder, children abduction and illegal immigrant issue. Each crime is discussed in the following sub-topics with instances of the real crime cases that have been reported. This information is presented in order to validate the main idea behind the proposed application, which is the Mobile to Server Face Recognition. This application results from the justification of the selected social situations.

Mobile to Server Face Recognition is an application involving face detection and recognition. In general, this application utilizes mobile phones as the platform or the client and a server. Inputs (images) are provided by the client (mobile phone) and will be sent over the server to be processed. The process of detecting and recognizing faces are done in the server side with the integration with the Matlab programs.

The idea of Mobile to Server Face Recognition has the similarity with the program that has been shown in James Bond latest movie, The Quantum of Solace. There was a scene in an opera theatre where James Bond (Daniel Craig) captured images of the suspected enemies using his mobile phones and sent them to the headquarters in London. Within a few seconds, he received the information of each of the images he sent. Even though it was just a movie but the logic justification behind the system is already existed. With the advanced technologies that we have today, it is not something that is impossible to be developed.

Human face is the primary identification method. Therefore, by recognizing face, we are able to gather information about the person. The nature of this method is embedded into Mobile to Server Face Recognition application to provide a convenient way to recognize a person and retrieve information of that person. Face detection and recognition is also one of the most difficult problems in computer vision area. This is the reason why this field receives a huge attention in medical field and research communities including biometric, pattern recognition and computer vision communities.
The first step for face recognition is face detection or can generally be regarded as face localization. It is to identify and localize the face. Face detection technology is imperative in order to support applications such as automatic lip reading, facial expression recognition and face recognition [5][6].

2. OBJECTIVE

The objective of this paper is to propose an application that can increase the efficiency in methods of identifying criminals using mobile phones and face recognition application.

3. SIGNIFICANCE OF THIS PAPER

This paper provides the rationale of the proposed application in both technical and social aspects that fulfilled the requirements to develop this application. Hence, this paper can be a lucid and concrete explanation of the proposed application to be understood by readers. Furthermore, the idea consists in this paper may contribute to deeper studies by other researchers.

4. CURRENT SOCIAL SITUATION IN MALAYSIA

This paper concentrates only on three major situations, which are rape and murder, children abductions (some of them were raped and murdered) and the issues of illegal immigrants pouring in to Malaysia. Here, a brief of tragic cases involving selected issues as mentioned earlier are discussed. Take note that the situations are taken from year 2003 onward.

4.1 Rape and Murder

A statistic from the resources of Women’s Aid Organization (WAO) shows that Selangor (as highlighted) has the highest number of rape cases reported among other states in Malaysia [7]. The statistic is depicted in Table 1.0. Please note that this figure is the number of cases that have been reported.

Surprisingly, the number of cases is increasing each year with the highest number of 3,098 cases in 2007. Rapists usually tend to be some acquaintances of the rape victims like friends, family members (father, brother) or even relatives (uncle, grandfather). But not all cases involved acquaintance. There are also lots of cases involving strangers or outsiders. Three cases of the most tragic rape and murder crimes involving strangers and acquaintance are discussed in brief.

Case 1: SuzailyMukhtar (2000)

In 2000, the country (Malaysia) received a vicious rape and murder news. Suzaily Mukhtar, a 24-year-old computer engineer was raped and murdered. Suzaily was on her way to work by boarding a public bus. She was assaulted by the bus driver, raped and killed in the same bus. After the driver dropped off the last passenger at another bus station, he turned to a different destination. He stopped somewhere around a housing project site area, which is secluded and out of the town to rape her. Suzaily was trying to draw attention from the passersby by knocking on the window. Unfortunately the bus windows were heavily tinted and people could hardly saw her. She was strangled to death with her own scarf and her body was thrown out of the bus by the roadside. The murderer was sentenced to death penalty and was hanged to death in 2008 [8].

Case 2: Canny Ong (2003)

Six years ago, in June 2003, Malaysia once again has been shocked with a tragic murder case of Canny Ong, a 28-year-old IT analyst. She was abducted from a basement parking lot and taken to a secluded area where she was raped and brutally murdered by a completely stranger. Two police officers who were on duty of special rounds unwarily confronted the

1 Refer to Appendix on Page 8
assailant for speeding and the victim was in the car. There was nothing suspicious and Canny did not call for help. At the same time, Canny’s family was in the middle of lodging a police report of her missing. Police found her body in a manhole and was all burned up after two days she was kidnapped.


Nurul Huda was ten when she was raped and killed by the Tenaga Nasional Berhad (TNB) station guards, not one but three. She was gang raped, sodomized and brutally strangled to her death in the TNB station guardhouse, which is only 300 meters from her house on her way to the grocery shop nearby. According to Mohamad Saat the manager of Gemilang Security Services (M) Sdn. Bhd, the security guard has deceived the company by using a false identity card to gain employment [9].

4.2 Children Abduction / Kidnapping / Missing

According to Interpol (Malaysia) [10], children kidnapping falls into two categories. The first category is disappearance under worrying circumstances and it is including those who are running away from home. The second category is abduction or kidnapping. Table 2.0 depicts a statistics for missing persons for 2006 until 2008 [11].

Children abduction cases are mostly based on monetary purposes, which means the kidnappers are asking for ransom from the parents. For this type of kidnapping, the kidnappers claim an amount of ransom for the sake of the children safety from his or her parents. Once the kidnappers receive the ransom, they usually release the abducted child. This case usually involves children from rich families.

There are also cases happened where the children were kidnapped and they had been handicapped. Then they were sent out to the streets to beg. Normally, the kidnappers target on young children aged from two to five years old. This kind of kidnappers usually works in a group or known as a syndicate. Worse cases happen where some of the kidnapped children were sold to other syndicates outside of Malaysia like in Thailand to be forced to work as prostitutes at a very young age.

Despite that, there are also kidnapping cases involving children without any clear motives, even lead to a murder of the children. Two most terrifying abduction crimes ever happened in our country (Malaysia) this recently are the kidnap and murder case of Nurin Jazlin Jazimin and the missing case of Sharlinie Mohd Nasyar. These cases are discussed here in brief.

Case 1: Nurin Jazlin Jazimin (2007)

In August 2007, Nurin Jazlin Jazimin was reported missing on her way alone to a night market near her house. She was eight years old when it happened. This case is so-called “the country’s most horrifying crime in years” due to the brutality and viciousness of the assailant(s) [12]. A month after her missing, she was found – dead. She was sexually abused that led to her death. Her body was found stuffed in a sports bag left by the stairwell at a shop lot and was naked [13]. A thorough medical examination has been performed on her body and the result was horrifying and sickening. Nurin was stuffed with a cucumber and a brinjal in her private parts, which caused her rectum to rupture and led to her death.

A series of hunting and high profile investigation has been carried out in order to seize the merciless assailant(s). The police managed to obtain two video footages captured by a CCTV camera near a shop lot where the sports bag containing her body was found. The police also acquired the assistance from FBI to examine and enhance the quality of the video footages [14]. In the video footages, it was noticed that there were a motorcyclist carrying the sport bag and leaving it at the shop lot as well as a woman loitering around the shop lot. However, the enhanced footage was a futile in attempt to recognize the face of the suspects and the motorcycle’s license plate [15].

Five suspects were arrested including one woman. The insufficient information and evidence however caused the suspects to be released. It also led this case to a dead end. Until today, the murderers are still free somewhere out there.

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A five-year-old Sharlinie went missing after she was playing at the playground with her eight-year-old sister [16]. The playground is about 200 meters from Sharlinie’s house. Another girl of aged six was by a man on a motorcycle two days before Sharlinie’s abduction. The man was said to lure the girl with a false excuse “looking for his cat” [17]. It happened about 2 kilometers from Sharlinie’s place. But the lucky girl was released three hours after being kidnapped. Hence, police said it might be the same man who abducted Sharlinie.

A massive search has been conducted throughout the country (Malaysia) and even to Thailand. Various different method of searching have been carried out including a widespread of Sharlinie’s posters and news, search on abandoned buildings and even a search from individual house to another. A sketch drawing of the suspect has been claimed and the copies of his face were spread everywhere. But nothing was fruitful. Another dead end occurred for this investigation.

After quite some time of conducting the search for Sharlinie, the police finally had to put it to an end. The search has been stopped and the assailant is still at large and may be looking for a new victim.

4.2 Illegal Immigrants

Malaysia has become the top destination for foreigners to come and work here due to its strategic location, which is in the middle of the Southeast Asia. Most of the foreigners or immigrants are from Indonesia and Philippines, followed by Bangladesh, Myanmar, Nepal and Vietnam. But there is a raise in numbers of Pakistanis, Afghans and Iraqi immigrant.

The latest numbers of illegal immigrants in Malaysia is having an increment, which an unhealthy situation for the country (Malaysia) reputation and safety. According to the statistics from the marine police and the Malaysian Maritime Enforcement Agency, since March 2009, four boats with 114 Indonesians, 58 Afghans, 37 Pakistanis and three Iraqis have been caught trying to cross from Malaysia into Indonesia [18].

One terrifying impact on the excessive numbers of illegal immigrants is the safety issue. The numbers of reported cases regarding violence is steadily increasing. House breakings, firearm or armed robberies and murders are the most reported cases. On May 13th, 2009, five Indonesians were shot dead after they broke into the local political secretary’s house with armed [19]. According to Royal Malaysia Police (RMP) statistics for 2008, 1849 violent cases and 3034 properties cases were reported involving immigrants. Indonesians were the highest number involved in these cases. They were involved in 1073 violent cases and 1400 properties cases. This is followed by the Filipinos at 416 and 1400 respectively. There was only one case, which involving foreigner from Singapore that concerned properties [20].

Malaysia has enforced and committed whipping sentence for those who are staying in the country illegally. Nevertheless, the punishment seems not to be scared or bothered. There are cases where illegal immigrants who have been deported to their respective countries after being imprisoned and whipped, still have the courage to illegally come to Malaysia again [21].

5. CURRENT PREVENTIONS AND ACTIONS

As we can see on the previous sub-topics of the true crimes, it is involving rape, murder, children abductions and crimes executed by illegal immigrants. There are questions that need to be answered. How effective is the law enforcement and the punishment could deter the criminals from repeating the same crimes in future? What are the actions that have been and may be taken as preventions? What can we do as civilians in order to help in prevention and cure the situations?

The police department plays an absolutely vital role to seize and punish the assailants but also with the help from civilians or individual. For instance, in Malaysia, Rakan Cop (which means Friends of Police) has been launched in 2005 and effectively running until today. Rakan Cop is a mechanism to assist police in order to trim down the number of crimes in Malaysia involving the participation from civilians as the “eyes and ears” of the police [22].

Spreading posters of the missing persons or wanted criminals is another method used to locate victims or culprits. This method is
conventional but yet effective. The posters are wide spread at packed places such as shopping complexes, bus stations, by the road sides as well as over the Internet.

For certain cases (e.g. Nurin Jazlin’s case), a special mechanism or alert has been introduced. N.U.R.I.N Alert (Nationwide Urgent Response Information Network) has been launched as a result of sympathy and concern of Malaysians [23].

Surveillance system offers a better security and prevention mechanism. The system utilizes Closed-Circuit Television (CCTV). It is first developed as a security mechanism for banks. But today, this system occupied at most places including shopping malls, schools, offices, parking zones, restaurants and even houses. It can be used for either indoor or outdoor purposes but with a limited monitoring area. For the case of Nurin Jazlin, video footages were taken from a CCTV located outside the building where her mutilated body was found. Average CCTVs offer a real situation but with a low quality of video. However, there is insignificant evidence that CCTV can deter crimes [24].

6. THE PROPOSED SYSTEM: MOBILE TO SERVER FACE RECOGNITION

Looking at the previous sub-topics discussing the preventions and actions, we have come out with a proposed application, which called Mobile to Server Face Recognition. A further explanation on this application is discussed the following sub-topics.

6.1 Brief explanation how this application works

Mobile to Server Face Recognition is a mobile application that deploys face recognition method. This application will be embedded directly into any mobile phone is enabled with Java and 3G technology and also equipped with a camera. This application is simple and easy to use by anyone even children. Our target users are the citizens including children. Mobile technology is getting diffused and mobile phone is a must-have appliance for most of us today. This application is making use of the booming mobile technology into something beneficial to the society.

The main idea of this system is to offer a simple application for public used in order to help reduce the number of crimes. The complexity of using mobile phone is very low which means it is very easy to use to perform tasks such as send and receive SMS or MMS, make calls and connect to the Internet. Due to the highly usage of mobile phones in Malaysia, mobile phone platform is preferred as the device for this system. As depicted in Table 3.0, it shows that the number of mobile phones subscribers is getting higher for each year [25].

Basically, our mobile phone will work as a device that captures images and sends them directly to the server (via Internet) and directly receives the information (from the server) about the images (persons) in a form of text messages. The basic mechanism works like this; when we see someone looks suspicious, we can just capture his/her picture using our mobile phones and send it to the server. The server will then return the information about the image to our mobile phone in a form of text message. The information includes the person’s name, age, nationality and status (e.g. freeman, in custody, wanted or any criminal records). Once we receive the information and (let say) it turns out to be that the image of the person is actually a wanted criminal. Thus, we can lodge a police report at the nearest police station regarding the information.

6.2 Technical aspects

There is not much of technical aspects can be discussed in this paper since it is a concept paper signifying ideas and concepts. This sub-topic discusses the fundamental technical characteristics involved with the system. Basically, this system will consist of two different parts, the server part and the face recognition part. Further explanation is provided as follows:

- **Mobile Platform** - This system will be embedded into any model of mobile phones that support Java technology and will be integrated with Java applications.

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• **Mobile Technology** - Java 2 Platform, Micro Edition (J2ME) technology will be used to provide an environment for this application running on mobile phones.
• **Hosting (Web Server)** - A server is required to host the application. This application will transmit and receive data over the Internet. Apache HTTP Server can be used as the web server using a normal pc.
• **Database / Dataset** - A small database or dataset will be developed for testing and evaluation. The database will consist of images and information of each of the images (e.g. name, age, gender, nationality and status).
• **Face Recognition method** - Face recognition part will be developed using Matlab software. It will be integrated with the server.

### 6.2 How this system can remedy the situations

The biggest question is how this system can be one of the solutions to the social situations in Malaysia. Based on the previous cases as discussed in the previous sub-topics, we can make an assessment using this system.

For Canny Ong’s case, there was a time where the policemen found her and the assailant in the same car. She looked suspicious. The policemen can use their mobile phone to take the passenger’s (Canny) image and send it to the Police Department database via the Internet. Within a few seconds, the policemen are able to receive a message indicating that the passenger is already indicated as “Missing Person”. Therefore, the policemen may arrest both Canny and the assailant at that time for further investigation. There could be a chance where Canny can be saved from being murdered.

For Nurul Huda’s case, the people of the management of the security company has been deceived by the security guard using false identity card to obtain the job. This system can be used to ensure that he is the real person as stated in the identity card. The people who are responsible for the job interview can capture his image from the photo in his application form and send it to the server. After a short period of time, they will receive information about him (the security guard) including criminal record(s) if he has any, which is varied from his given particulars. They can contact the police immediately for further actions.

This application can be implemented on mobile phones as the core platform but it can as well be implemented on other devices such as Closed-Circuit Television (CCTV) and high-speed cameras. Take the TNB security guard identity fraud case for instance, if this system can be integrated with the CCTV system using high speed camera at the office, once the person enters the building, the high speed camera captures his image and runs Mobile to Server Face Recognition. The captured images will be sent to the Police Department’s server and information will be retrieved from their database. The information is then will be returned to the persons who are in charged with the system. Hence, an appropriate action can be taken.

### 7. CONCLUSION

Mobile to Server Face Recognition is proposed as result to the current situations happening in Malaysia. This paper is merely a basic concept of how this system can remedy the problems stated earlier on and emphasize more on the real situations. Basically, from the current situations we can relate it to the idea of this system. Thus, there is not much of technical description included in this paper. It is hoped that this paper may be able to contribute ideas for the particular area and could be a kick-start for more solid development. A series of technical implementation will be carried out to develop a prototype based on this concept.

If this system can be developed with a highly effective rate, there will be possibilities of collaboration with Royal Malaysia Police Department and the Immigration Department. It is not impossible that this system may be a new alternative to help the government to deter crimes in future. Undoubtedly, there are so much of tasks to be accomplished to take this system into action. However, by providing such information like this regarding the proposed system, it may be able to contribute to some extent and profound studies.

### REFERENCE


APPENDIX

Table 1.0: Statistic of Rape Cases Reported in Malaysia in 2000 – 2007 [7]

<table>
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(The data provided is in Malay language)

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Tahun = Year; Keseluruhan Hilang = Total Missing; Jumpa Semula = Found; Masih Hilang = Still Missing; L = Male; P = Female; Jumlah = Total; Jumlah Besar = Sum

Table 3.0: Statistics of Number of Mobile Phone Users in Malaysia [25]

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<td>1,944,200</td>
<td>2,138,600</td>
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