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IT'S a facial recognition system that helps in nabbing criminals and getting evidence against those who break the law.

But soon, the CamMuka service, developed by our own CyberSecurity Malaysia, will be available for use in civil cases too.

Examples of civil cases are lawsuits or disputes involving damages for personal injuries, motor vehicle accidents, breach of contracts and so on.

The CamMuka technology was first launched in 2017, but CyberSecurity, as the national cyber security specialist agency, is coming up with CamMuka 2.0 – a new and improved version with more accuracy.

It will be launched this Thursday, Jan 14.

"The new version of CamMuka will introduce better AI (artificial intelligence) models for more accuracy and robustness against quality.

"The service is also being planned to be offered to aid civil cases soon," CyberSecurity Malaysia chief executive officer Datuk Dr Amirudin Abdul Wahab tells *Sunday Star*.

Currently, the CamMuka system is offered as a service by CyberSecurity's digital forensics department to help criminal investigations handled by law enforcement agencies like the police, Customs and Immigration Department.

Types of cases that are usually received range from fraud, domestic violence, narcotics to animal abuse cases.

"CamMuka analysis results can be used in civil or criminal courts, to establish or challenge an identity of a person in a video recording," Dr Amirudin says.

But before it's ready for civil cases, CyberSecurity needs to develop a few more modules and present the system to the authorities.

By definition, CamMuka is a computer system that is capable of automatically detecting a person's face from a video or photo evidence across a collection of individual faces.

The first step in the process is when an investigating officer requests for an analysis, by bringing video or photo evidence together with several digital photos of the people they would like to investigate.

# Facing off wrong-doers with more accuracy

A new version of CamMuka, a facial recognition system by CyberSecurity Malaysia, will be launched on Jan 14. It will soon be available to help in civil cases, aside from being used in criminal investigations.



Valuable evidence: A facial recognition analysis can be used in court to establish or challenge an identity of a person in a video recording.

Cases brought for analysis mostly involve CCTV videos, or visual recordings on mobile phones and digital cameras.

"We will then conduct a biometrics analysis by following standard operating procedures (SOPs).

"In certain cases, we go to the law enforcement agency's premises to record faces of the individuals in question," explains Dr Amirudin.

The results from CamMuka can then be used as evidence in prosecuting criminals and court cases.

"The AI behind CamMuka is proven and backed with scientific journals and citations.

"The application is also backed with SOPs and methodology that follows digital forensics standards such as the Scientific Working Group on Digital Evidence guideline," he says.

CyberSecurity's laboratories and expertise has also been accredited by the American National Standards Institute (ANSI) National Accreditation Board.

The unique feature of the CamMuka face recognition engine is that it's specifically designed for

Labeled Faces in the Wild (LFW).

LFW is a segment of face recognition research that targets the recognition of face images which exhibits "natural" variability in pose, lighting, focus, resolution, facial expression, age, gender, race, accessories, make-up, background, and photographic quality.

"The quality of the dataset used in LFW is as close as real-life video evidence quality, in which we saw as a good fit for forensic application.

"As a result, the matching capability of CamMuka is successful across a variety of video qualities and from various types of video recording devices," he says.

However, the performance of CamMuka's face recognition engine is limited by the quality of the face samples from the evidence.

For example, the system works best with face resolutions higher than 1,000 pixels.

"Any resolution lower than that may cause accuracy to suffer.

"The clarity and brightness of facial features in evidence samples are also factors that affect the accuracy.

"We found that faces recorded in dark settings usually result in unsuccessful matches," Dr Amirudin says.

On CamMuka 2.0, he says the new version of the system will be a service provided from a cloud.

"The new version will also enable CamMuka to be deployed on various computing devices from personal computers, laptops and other devices," Dr Amirudin says.

CyberSecurity plans to push CamMuka for surveillance purposes as well.

"We have already laid out several ideas in the pipeline for CamMuka to be deployed for real-time face recognition and face clustering to further enhance digital evidence collection capabilities for surveillance.

"The strategy to shift CamMuka services to the cloud is also partly to prepare for the upcoming 5G technology in the near future," he says.

Interestingly, there is a database of faces of Malaysians where CamMuka matches visual evidence with individuals.

"We have collected a population database together with demographic information with the help of universities and law enforcement agencies.

"However, the database is still small in terms of size.

"More local face data collection is required in building a stronger and more accurate AI model for the CamMuka engine.

"The database is also in dire need to be expanded and extensively cover Malaysians, especially in factors like ethnicity, age, gender and location," he says.

CyberSecurity is working with its academic partners on the data collection process.

"The data collection will be conducted in a lawful way. We welcome volunteers to contribute in this process to make CamMuka

better and ultimately, boost public safety," Dr Amirudin says.

While some believe facial recognition technology may invade privacy, it is needed to stop serious crimes.

"Despite how controversial facial recognition technology is to some countries, we cannot deny the importance of this technology in ensuring the safety and the wellness of the people.

"With the Smart City initiative by the government, the deployment of CCTVs for surveillance is no longer sufficient for monitoring purposes.

"The surveillance should be enhanced with AI to better equip our society with intelligent tools to detect and track unlawful characters and behaviours," Dr Amirudin says.

He adds that such technology can help our authorities in efficiently collecting meaningful evidence in stopping and prosecuting criminals.

"This is crucial especially at our borders to detect illegal entries, as well as drug and human trafficking.

"The technology also enables us to effectively track dangerous individuals via surveillance," he says.

On adapting to the new normal in the Covid-19 pandemic, Japan's NEC Corp recently launched a facial recognition system that identifies people even when they are wearing masks.

Asked whether CamMuka can do this too, Dr Amirudin says CamMuka 2.0 can only detect whether a person is wearing a mask or not.

"Thus, CamMuka is unable to perform facial recognition on people wearing masks.

"Nevertheless, CyberSecurity always looks forward to working with the industry, and in this case, we may approach NEC for a collaboration," he says.