

Press release

For immediate release

The First Edge Computing AI Chip in Hong Kong for Real-time Video Analytics in Child Protection and Patient/Elderly Risks Monitoring during Omicron Outbreak

March 10, 2022

The society recently raised extra concerns about child safety after the alleged abuse and neglect reporting incidents at a children’s caring home, demanding better monitoring and enforcement of the law. Meanwhile, the Omicron outbreak also placed a heavy burden on public health care and isolation facilities, where we saw a surge of infection cases. Video monitoring appears to be an alternative to ease the shortage of healthcare staff at both clinical and elderly facilities during the pandemic situation. Nevertheless, security and privacy are some concerns of video monitoring that have to be resolved.

In light of this, the Data Science Lab at Department of Statistics and Actuarial Science (SAAS), The University of Hong Kong (HKU) has developed several real-time video analytics apps using the first Hong Kong-made edge computing AI chip donated by Marvel Digital AI Limited, making it able to detect human body’s movements (e.g. walking, falling, leaving room, etc.) and facial expression (e.g. crying, yelling, etc.).

Applying the techniques of bounding box detection, object detection, and motion classification, the team built the app with “ResNet-32”, a Deep Learning Neural Network specified in image recognition, and “Flasks”, the framework of programming language Python, for video analysis, and used over 5,000 images on average collected from Internet to train each model. Densifying the data centre network, the edge computing AI chip allows faster computing, better data security, and efficient control over the continuous operation – it is ten times faster than the market edge-based AI chip in terms of computation power.

Since the video analysis are done in the AI chip itself, it does not require running the apps in a cloud computing platform, thus overcoming the security and privacy concerns of video transmission on the Internet. In addition, the AI chip can be implemented in any device such as robotic pet, surveillance camera, etc. It can be used in the homecare/childcare/elderly care centres, offices, shopping malls, or hotels for risk detection and personal care monitoring.

In the case of child abuse at children’s caring home, the video analytics apps can be deployed for childcare monitoring. Also, the apps can assist nurses in monitoring patient risks in isolation wards, alerting them if patients leave the ward, asking for helping or deliberately self-extubate their endotracheal tubes, and helping elderly homes to detect elderly care risks such as falling and yelling for help, etc.

“It is the first edge computing AI chip developed by our company in Hong Kong. Thanks to Data Science Lab for deploying our newly invented AI chip with their real-time novel video analytics apps that overcome the security and privacy concerns on video analytics and surveillance,” said Dr Patrick MA, CEO of Marvel Digital AI Limited.

Other than security and safety monitoring, the AI chip can also be used in processing and analysing big data in finance and medicine, for investment and disease diagnosis decision-making, virtual reality, robot automation, smart home, physical and cognitive training, drug and gene discover. “Data Science Lab is currently researching on a novel parallel and distributed AI algorithm and is planning to deploy it in an environment of clustered edge computing AI chips. In this way, a real-time big data analytics with a supercomputing power can be done and is a breakthrough in AI development,” said Dr Adela LAU, Deputy Director of the HKU SAAS Data Science Lab.

About HKU SAAS Data Science Lab

The project team of Data Science Lab at HKU comprises Head of Department of Statistics and Actuarial Science (SAAS) Professor Guosheng YIN, Director of the SAAS Data Science Lab Dr Eddy LAM, Deputy Director Dr Adela LAU, as well as undergraduate and taught postgraduate students in the Department.

For more information of the Lab, please visit: <https://bit.ly/3KfYsfP>

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Figure 1a & 1b. Baby’s movement detection: walking & crawling.



Figure 2. Fire alarming detection.



Figure 3. Door open detection.



Figure 4. An overview of system design for the real-time Edge Computing AI Chip.

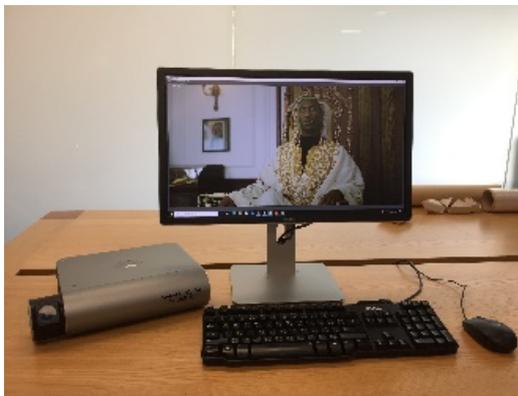


Figure 5. The Edge Computing AI Chip (with desktop machine) developed by Marvel Digital AI Limited.



Figure 6. Project Meeting with Marvel Digital AI Limited at Hong Kong Science Park.
 From left to right: Dr Patrick MA (CEO of Marvel Digital AI Limited), Professor Guosheng YIN (HKU Head of Department of Statistics and Actuarial Science), Dr Herbert LEE (Chairman of Marvel Digital AI Limited) and Dr Adela LAU (Deputy Director of SAAS Data Science Lab)