SUCCESS STORY

Innovative Real-time High-speed ANPR System with Basler ace Cameras

Customer

- Customer: Optasia Systems Pte Ltd
- Location: Singapore
- Industry: Intelligent Transportation Systems (ITS)
- Implementation: 2016

Application

Automatic number plate recognition (ANPR), also known as license plate recognition (LPR), for fast-moving vehicles has always been a challenging task, especially when using an IP camera-based traffic monitoring system. In many cases, this is due to basic, low-end sensors typically used in IP cameras with very limited sensitivity, resulting in long exposure times and therefore blurred images. Furthermore, video compression reduces the image information and leads to compression artefacts which decrease the capture rate of highly detailed car license plates significantly. With increasing numbers of traffic violations raising safety concerns, Singapore was looking for a better solution. This created the need for an efficient ANPR system to conduct traffic monitoring and enforcement in real-time and at high speed, of both retroreflective and non-retro car plates.

Solution and Benefits

Optasia Systems is an innovative technology company incorporated in Singapore and specializing in developing and marketing ANPR systems. To overcome the shortcomings of the existing traffic monitoring systems, the company has developed a real-time high-speed automatic license plate reader, known as Optasia IMPS(TM) Video Analytics LPR. Basler’s distributor, Soda Vision, promptly offered support throughout the system development process, which included providing a sample for proof of concept in the initial phase.

The system works by being able to achieve correct exposure of the car license plate, detecting the car license plate, cropping the image to the region containing the license plates and sending the cropped image to the processing unit for ANPR.

Being able to crop the image to only the much smaller region containing the license plate increases the speed of processing and allows for real-time multi-lane ANPR. Over 24 hours, the system has to compensate for the sunlight direction as the sun rises and sets. This causes car plates to be over-exposed when the sun is shining directly onto the plate and darkened when in the shadow as the sun shines into the camera. Also, the retro-reflective plates expose normally during the day but become over-exposed in the night when the illuminator is used. With Basler’s ace camera, frame-by-frame control of exposure is possible and easily programmed to react appropriately to day, night, back-lit and front-lit lighting conditions for both retro and non-retro reflective plates.

The camera plays a very important role in this system. Optasia Systems needs a camera which can respond in real-time to frame-by-frame changing of exposure to handle both retro and non-retro car plates, using a technique known as exposure bracketing. In addition, the cameras are required to handle an external strobe illuminator for high intensity.

Basler’s ace camera is chosen for this system for its sequencer ability to do exposure bracketing. Certain features such as exposure bracketing require real-time setting for exposure time and gain, on a frame-by-frame basis. In addition, the sensor used in that camera, the IMX249, has a very high dynamic range which allows the camera to operate more easily in the difficult lighting conditions. It belongs to the new Sony Pregius series and has outstanding image quality. This combination made it a perfect fit for this application.
CEO Mr Richard Goh, who developed this system with his team, comments: “Basler’s GigE camera and pylon SDK fulfil our requirements easily and conveniently.

The camera’s I/O port allows direct synchronization with the external illuminator for high intensity and low power consumption. Overall, we are very satisfied with the camera performance, as well as the excellent technical support given by Basler’s support team during the integration phase.”

This efficient and reliable car license plate recognition and violation detection system has been deployed with success by a Singapore government body since 2016.

Technologies Used
- Basler acA1920-40gm (GigE IMX249 camera)
- Software: Optasia IMPS™ Video Analytics LPR
- Lighting: Sunlight and strobed NIR 850nm illuminator
- Others: Intel i7 4C/8T processor

More Information
Richard@optasia.com.sg

Watch the video at: https://youtu.be/W4i25HyawTg

Basler acA1920-40gm (GigE IMX249 Camera)