

Optical illusion

In the field of LPR, fast image processing times and powerful data recognition are a necessity, especially when the applications this technology is used for are potentially a matter of life and death

Homeland security is always going to be a dominant issue for any nation whose land has borders to other countries – none more so than in the USA, where politics is also a motivation: “Since 9/11 the emphasis has been on national security, explains Dr Juan Herrera, engineering manager, Perceptics LLC. “The need for controlling the movement of vehicles, goods, and people at international borders between countries without imposing unnecessary traffic delays and congestion at land-border crossings is great. At the same time, you want to maintain a high level of safety and security.”

Herrera has over 20 years of practical experience in optical character recognition

(OCR), machine vision, artificial intelligence, image processing, and pattern recognition and was the original developer of Perceptics’ License Plate Reader system, for which he was granted a US patent in 1989.

Both technology and politics have moved on rapidly since the late 1980s and Perceptics believes that there is a growing need for automated real-time risk assessment for vehicles and travelers, as well as the need to archive the images that could be used at a later time for forensic/legal analysis.

The company has a portfolio of products that read license plates at international borders all around the world. Those products are used to identify passenger vehicles, motorcycles, and commercial

cargo vehicles, and they work 24 hours a day, seven days a week and under any weather condition.

Latest developments include new products that house all the electronics in a weatherproof enclosure that can reside at the lane right next to traffic and is capable of performing functions in real time and close to where the events are captured. This is a big leap from previous generations where electronics were solely intended for an office environment. Herrera explains: “It’s a whole architecture: we refer to it as the NVP, the network video processor, and it’s designed to have each node in the system as close to the edge as possible. By the time that you bring it into the network that data has been processed.”

TIME FOR TECHNOLOGY

When you understand how time sensitive the applications for this technology are, it is clear that any solution that can shave a few seconds off each process is a necessary investment. At international borders, for instance, there is an officer charged with being able to make a decision: they only have a few seconds to make the decision regarding whether or not to let that vehicle to go through, refer it to a secondary inspection, or to simply deny access to that vehicle. Perceptics’ products help in making that decision by capturing the data and then feeding it through a database to conduct some brief analysis. Based on the response of that query the inspector can then make his decision.

These products are not just used for border control – other applications include access control for facilities and toll enforcement. Perceptics describes the technology it deploys as ‘state-of-the-art image processing.’ But this is not simply marketing hype: what sets Perceptics apart from the competition is the capability to identify the state, province or country of origin of the license plate for each vehicle.



License plate readers from Perceptics can be used for a variety of security-conscious applications



📌 Image data can be captured and then archived for later analysis in order to spot traffic trends

The products can also recognize both retro- and non-retroreflective plates. This is all achieved at highway speeds, without blurring. While other companies can achieve this for retroreflective plates, it is harder to do it for non-retroreflective plates to the same quality during both day and night. Perceptics' systems can handle both sets equally well in any ambient lighting condition and any weather condition.

THE FUTURE

Governments are adding more machine-readable redundant technologies to be able to identify license plates in different ways, to identify each one uniquely and also to prevent people from forging them. They are adding items like barcodes, RFID tags and watermarks. But the requirement for human-readable vehicle identification numbers is not going to go away any time soon: when it comes to perform an enforcement action, there will always be that need to be able to describe to an enforcement officer how they can identify the vehicle beyond just informing them of the make, model or color.

Perceptics is also widening its range of applications to keep up with current trends. This includes applications not only for identifying vehicles but also for archiving

that image data for the user to perform analysis at a later date. Users want to be able to identify traffic trends that might lead them to detect patterns associated with criminal activities. One example might be if a vehicle is spotted that contains contraband, enforcement officers may want to take a look at other vehicles that are around at the same time.

As well as this focus on security and enforcement, the need for free-flow traffic is also recognized by Perceptics. The company has integrated its LPR with RF technology to be able to identify not only the vehicle but also the passengers. This has been used to expedite traffic around land border crossings where people that are frequent commuters can be pre-cleared and issued with an RFID card in order to cross through dedicated traffic lanes automatically. This means that Perceptics' products can conduct the security enforcement, as well as monitoring the passage of both vehicle and passengers. The idea is to be able to manage low risk travelers and improve the overall traffic flow.

BETTER, FASTER

For security and enforcement applications, the need to maintain these state-of-the-art features is crucial. Perceptics is currently



📌 Electronics are in a weatherproof enclosure

focusing on the higher-end applications where read accuracy is of vital importance, where being able to detect in excess of 99 percent of vehicles going through a given point is important – and being able to do that in real time. In addition, the company is also continuing to optimize its software algorithms for OCR and to better recognize the origin of plates. ■

For more information about Perceptics' products, please contact the company on Tel: +1 865 966 9200, or by emailing john.dalton@perceptics.com. Alternatively, log on to www.perceptics.com