Liquids, gels and large electronic items can now be screened without removing them from hand luggage

ELEVATING CHECKPOINT EFFICIENCY

Philo Daniel *on how the latest technologies can speed up checkpoint screening*

Advances in AI-based algorithms have enabled real-time, automatic identification of a fast growing list of prohibited items ranging from weapons to currency. By framing any suspect items, image analysts can make faster, more accurate decisions which increases both security levels and efficiency. Smiths Detection has tested this concept for several years and the results are such that it is proven safe and more accurate than when screened only by human operators.

These algorithms are already used to assist operators by drawing a frame around detected items, increasing efficiency and security. These intelligent algorithms are also central to the ongoing move towards automation and alarm-only viewing at the passenger checkpoint.

ALARM-ONLY VIEWING – CERTIFICATION UNDERWAY

Regulators are looking to automatically clear the vast majority of checkpoint security images that are not alarmed and testing for EU ECAC APIDS Standards (Automatic Prohibited Items Detection Systems) certification is underway. There will be three Standards, each increasing in levels of detection and decreasing in percentage of mandatory random alarms, allowing gradual progression in the direction of alarm-only viewing.

It is likely individual countries will permit alarm-only systems first and then pan-European approval will follow. The goal is a progressive reduction in the number of images shown on screens that must be viewed by an operative until most are AI-screened and only 15 to 20 percent need additional human scrutiny. Smiths Detection is expecting certification by autumn 2023 for its iCMORE APIDS algorithm.

CT SCANNING IS SET TO BECOME THE NORM

Because of its ability to generate 3D images, CT technology delivers increased efficiency, security and passenger experience, which soon outweighs the initial capital outlay. By allowing the examination of bag contents from every angle, CT technology makes it easier to discriminate between benign and suspect items, for example a bar of chocolate and a batch of explosives. Liquids, gels and large electronic items can be screened without removing them from hand luggage. It is additionally the only technology that is currently capable of meeting future standards (e.g. EDS CB C4).

Regulators are keen for the adoption of this new equipment, with the UK, for example, setting a deadline of June 2024 for the introduction of the latest generation of EDS CB C3-approved CT scanners. The first users of C3 technology, such as the second largest airport in Jeju, South Korea, have seen immediate benefits since the installation of the new scanning technology.

The 3D images created by the new technology means fewer items need to be removed from luggage. This in turn means fewer trays and when coupled with automatic tray handling, Jeju saw a 50 percent increase in passenger throughput to between 400 and 500 trays an hour after switching from conventional scanning systems.

At London's Gatwick Airport, for example, around 10,000 hand luggage items are currently being rejected each day because liquids and large electronics have not been correctly removed, adding an average five minutes to the time a passenger takes to pass through security, which at peak times significantly contributes to delays.

Airports around the world will be questioning whether or not a system upgrade such as this is entirely cost-effective, although the trend is towards regulation in favour of CT technology and there are efficiency gains for the airport as well as a much-improved passenger experience.

Although CT scanning is not yet mandatory, those airports that already have C3 in operation have a competitive advantage over other rival hubs where liquids and laptops must still be removed from baggage. However, passengers can expect C3 to be very much the norm at the world's major hubs over the next few years.

CENTRAL IMAGE PROCESSING

Centralised Image Evaluation allows a team located centrally and away from the checkpoint to examine x-ray images taken across the airport in a much quieter location, offering many efficiency benefits. One of the main benefits of Centralised Image Evaluation is the ability to multiplex images. Multiplexing facilitates a flexible ratio of operators to lanes so resources can be optimised to meet the peaks and troughs of demand and individual operational objectives. X-ray images taken across all security lanes are sent to the first available person. Multiple images can be reviewed simultaneously by multiple analysts, removing the need to pause conveyors during the inspection process and ensuring the optimum use of equipment.

An added advantage is that staff can be switched to different locations, another airport or even country or continent. The cost efficiencies are impressive — as high as cutting the number of analysts and subsequent daily costs by over 70 percent.

CONTACTLESS TRAVEL AND PRE-TRAVEL PASSENGER PROFILING ARE ON THE HORIZON

REMOTE SCREENING ACROSS SEVERAL SITES

Air cargo screening operations are typically well suited to central image processing. A major difference in screening air-cargo compared with air travel is that screening operations are conducted in a fully automated environment with little to no human interaction. In addition to this, air-cargo providers generally have multiple processing facilities where screening is conducted with items packed and transported to airports. This operational model lends itself very well to centralised image processing (CIP) as screening processes and operations are identical between all sites. Although peak demand varies between sites, it is rare for screener demand for all sites to be identical throughout the day.

AUTOMATIC TRAY RETURN SYSTEMS

Automatic tray return is not a new concept and there are many airports globally harnessing the efficiency gains. However, even greater efficiency can be achieved by leveraging data, AI, automation and connectivity.

Automatic recirculation not only speeds up the flow of passengers, but it additionally allows staff to be redeployed as it removes the need for trays to be manually carried back to the starting point. The net result is increased throughput, cost reduction, shorter queues and happier passengers. Moreover, automated tray return, coupled with data analytics and reporting applications, provides airports with KPIs, giving them accurate pointers of how staff should be deployed.

The pandemic sped up the introduction of another innovation, UV light sterilisation, which, while not

visible to the average passenger, helps cut airport operator costs. The UV application, means trays are sterilised as they pass through the system, killing viruses, removing the need for operatives to undertake the process manually and reducing the risk of staff and passenger sickness.

UNACCOMPANIED BAGGAGE INSPECTION

If passengers fail to board a flight, their checked bags no longer need to be unloaded from the aircraft. Using UBI, the original baggage screening images are automatically retrieved and sent to a qualified security operator for re-inspection. If cleared, the baggage can stay on board, preventing turnaround delays and supporting better on-time performance.

It saves airlines and airports the time and effort needed to find and unload bags; helps them keep to tight schedules; and avoids very costly delays on the tarmac with engines running. The bags can then be redelivered back to the origin on the return flight.

CONTACTLESS FUTURE

Contactless travel and pre-travel passenger profiling are definitely on the horizon and pre-screening before entering the terminal is soon be adopted in some countries. Last summer's issues with staffing at airports could be alleviated with systems already developed but not yet licensed. However, the tide is firmly in the direction of contactless travel and pre-travel passenger profiling. The UK is due to start testing contactless border crossing in 2024. New technologies will allow some passengers to enter the UK via automated border screening, without using an eGate or speaking to a UK Border Force officer. The UK government says Electronic

Travel Authorisations will also allow more international visitors to use eGates via a Digital Customer Account. Initiatives such as these will be a precursor to other developments that are only a few years further away.

RISK-BASED SCREENING

Advances in AI and biometrics signal the end of a 'one-size-fits-all' approach to security screening and open the door to Risk-based screening (RBS). RBS uses facial recognition and passenger information such as destination, point of origin, ticketing, routing and travel behaviour to profile passengers. Where needed, more stringent screening processes can be

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authorised. The EU-funded iBorderCtrl project is one example of RBS. Initially tested pre-pandemic and aimed at non-EU citizens crossing borders, it uses a two-stage procedure to assess applicants before they travel.

Technology is advancing in leaps and bounds, but legislation is generally a slower, more measured process. The introduction of the EU ECAC APIDS Standards is encouraging and shows legislators are happy to embrace new approaches. However, RBS is more controversial as it may contravene privacy laws in some countries. For example, the technology to match the passenger with the right boarding card and cabin baggage already exists but most countries are not quite ready for it yet. But make no mistake, RBS is on the way ●

Philo Daniel is Global Director Aviation at Smiths Detection.

Passengers can expect C3 to be the norm at the world's major hubs in the next few years