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Using biometrics to manage increasing passenger numbers

Removing the need for physical separation

Intelligence in Aviation

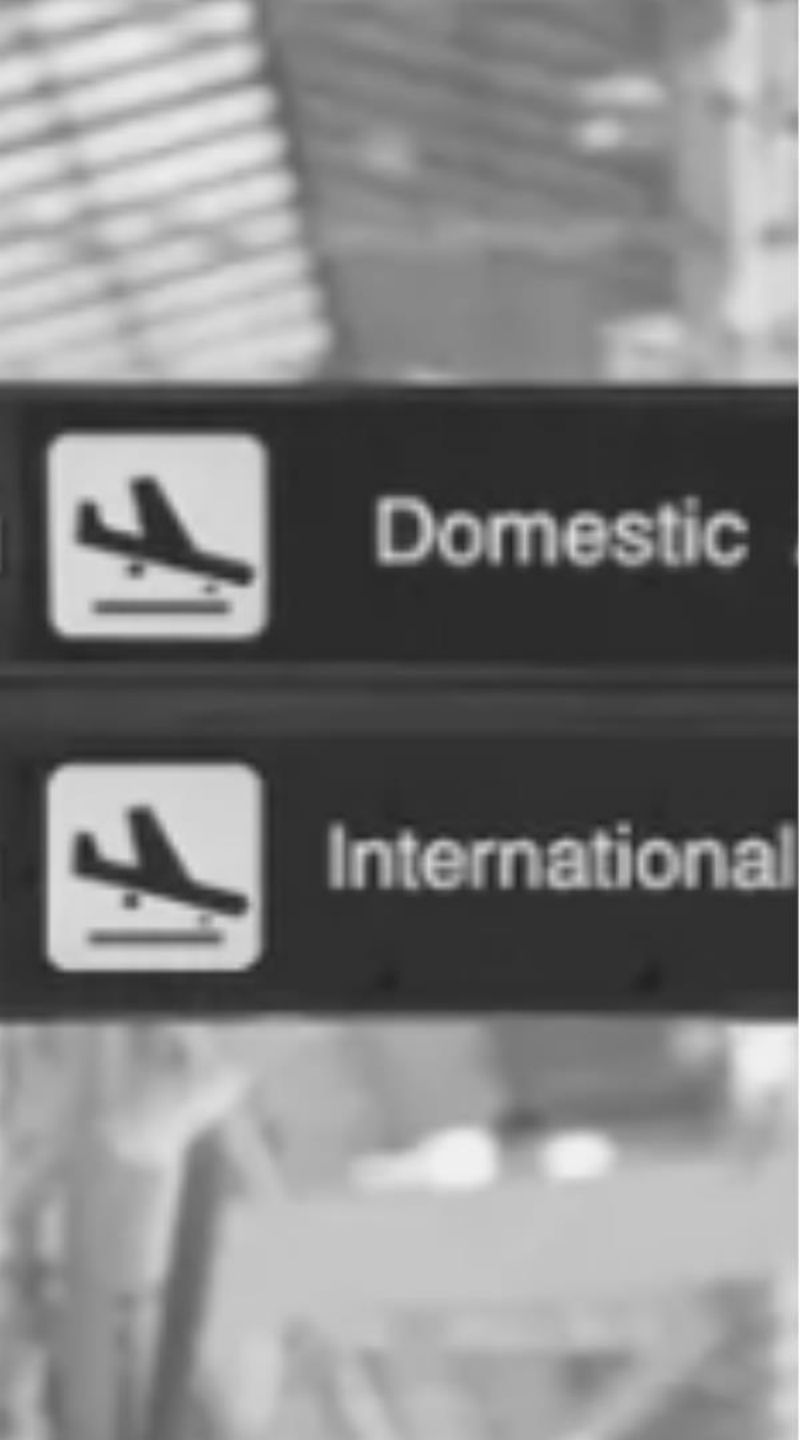
The first line of almost every article we read about aviation starts by saying that passenger numbers will grow significantly over the coming years.

There is also a recognition that building new terminal capacity will not keep pace with this growth, so more people will have to be managed from the existing buildings.

Much has been written about improving the passenger experience using self-service channels and streamlining procedures for security checks so that queuing is minimised.

Aurora's experience at Heathrow and Manchester Airports points to another complimentary approach…

Use biometrics to allow all passengers to share the same terminal space.



In most airports, terminal space is segregated to ensure that international and domestic travellers cannot mix. Physical separation using walls is required to prevent abuse of the border controls.

What if we could remove these walls?

This would enable the airport to manage all inbound and outbound flights without restriction, thus increasing capacity without having to build new facilities.

This is already a reality at three UK airports which use biometrics to verify passengers as they board a plane. Aurora Face Recognition is used at Heathrow and Manchester airports as a key component of managing these ‘common departure lounges’.

In this paper we explain how this system works and examine some of the new developments underway to alleviate privacy concerns.

The common departure lounge

At Heathrow T2 and T5, all domestic travellers are required to enrol in the Aurora Face Recognition system as they transit airside. When they present their boarding pass at the entry to security checks (ticket presentation), the data on the barcode is checked and if they are travelling to a domestic destination, the face recognition camera starts and they can only proceed once the enrolment is completed.

This takes a few seconds and can be performed either at a self-service gate or at the attended desks.

When the passenger goes to board the plane, a similar process occurs but this time to verify the passenger. Again, this is offered as a self-service option or as part of the manual boarding process.

This means that only domestic travellers can board a domestic flight – if a passenger that holds an international boarding pass attempts to board, they will be rejected as there is no biometric enrolment.

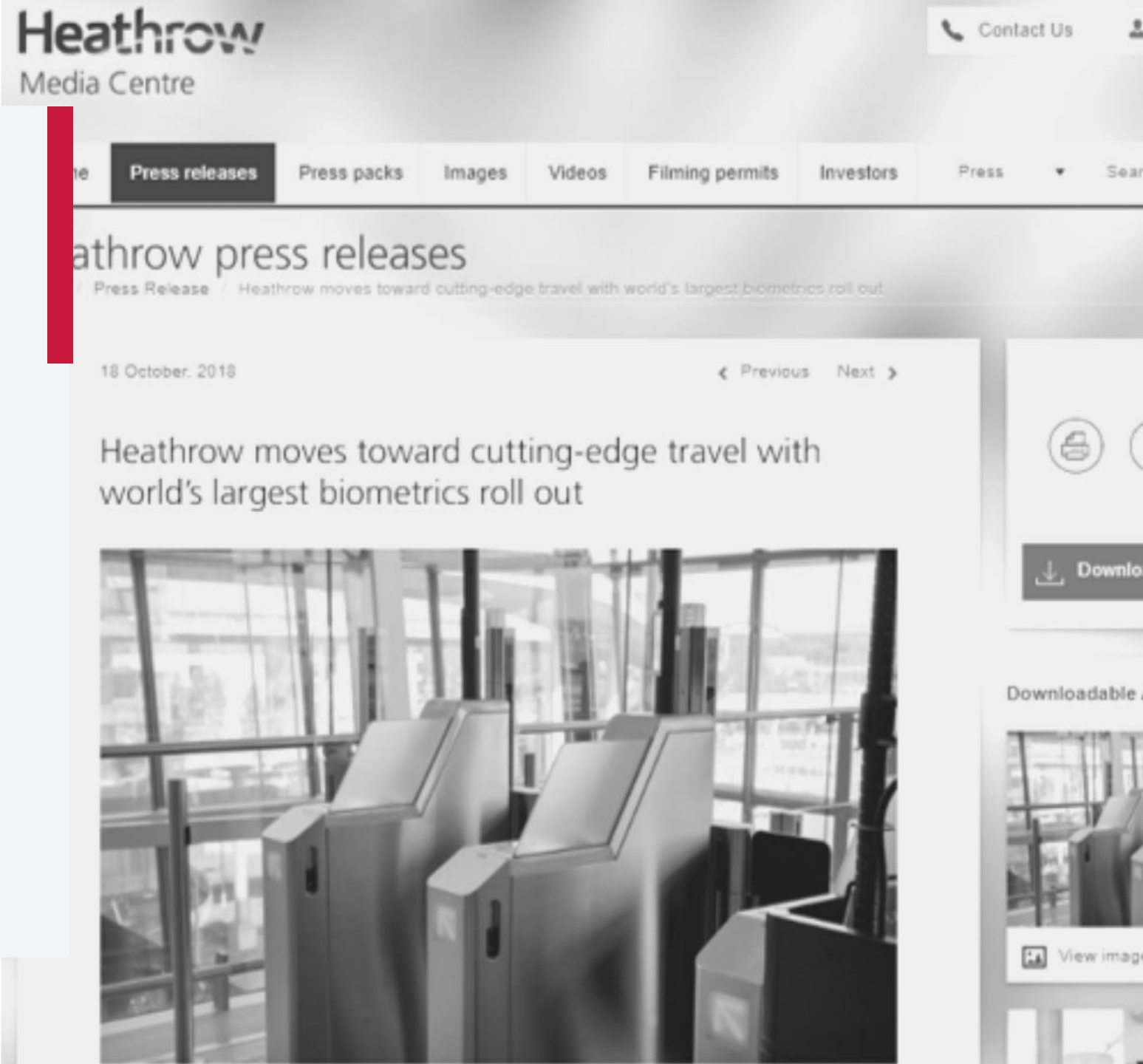
This system has operated successfully since 2010, processing more than 50 million passengers in the following decade.

Self service for all

In October 2018, Heathrow announced their plans to extend the use of the Face Recognition to all passengers.

Read the news release here.

This will mean that all passengers will be verified as they go through all the departure processing – expanding the use of the Aurora cameras to 80 million passengers each year.



What about privacy?

The current systems at Heathrow and Manchester only use the biometric data for a single flight. All data is deleted once the aircraft lands without incident. If the passenger flies again then a new enrolment is captured meaning that personal data is kept for the minimum time.

New concepts are being considered given the almost ubiquitous use of mobile phones. Passengers can carry their biometric data with them meaning the airport doesn't need to store it, reducing risk of compromise.

In addition, new solutions are in development to split the biometric data (the templates) such that the airport retains a portion and the passenger has the other portion. Hence neither party has a full copy. The template is only recombined at the check-point vastly reducing the potential for loss of personal data.

Privacy will always remain an issue. But, new technology solutions are on the horizon to minimise the risk.

Maximising asset use

Managing more passengers through the same terminal will require multiple changes to existing practice.

Self-service options alone will not be enough to cope with the projected increase in passenger numbers.

Given that there is operational proof that Face Recognition can be used to remove the need to physically separate passengers in different terminal buildings, isn't it time to consider removing walls to provide more capacity?

Why Aurora?

As far as we are aware, Aurora Face Recognition is one of only two systems that are used to protect a national border, where the process is unsupervised.

No border guards are viewing the transactions and hence there is no intervention possible.

In order to gain this level of trust in the Aurora system, there was an 18 month period of testing with Heathrow and the Border Force prior to the initial deployment. One of the key factors in the decision to proceed was Aurora's use of infrared (IR) illumination.

Unlike visible light cameras where images can be dramatically degraded by changes in lighting, the Aurora IR cameras produce consistent images all the time, night or day. In addition, the use of IR flash means there is perfect illumination tuned to the face and no motion blur. Taking all these factors together means that the performance in the lab is replicated in real life.

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For more information about using biometrics to manage increasing passenger numbers:

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