# *FASTPASS* NEWSLETTER #13
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Visit of experts at the FastPass demosites

One highlight of the FastPass project was the demonstration phase. Concrete implementation of a 3-years research work, the demonstrations, installed at three different types of border (sea, air and land) constitute a major outcome. The European Commission has appointed experts of the field to visit those installations and provide some analysis and comments on the work done by the Consortium. The main results of the demonstrations are reported below.

Visit of the Expert at the FastPass sea border demosite, 22nd September 2016
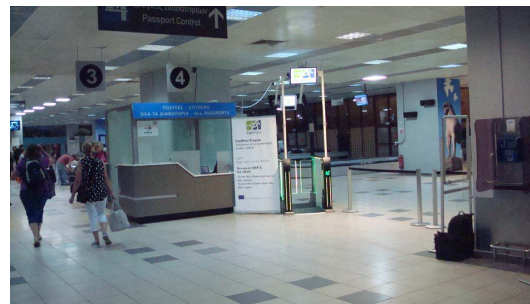
Overview of the FastPass installation at the Port of Piraeus (Greece): kiosk at the border control hall (left side); egate and border control station (on the right side) . © FastPass consortium

On the 22nd of September, an expert appointed by the European Commission was invited to visit the FastPass installation at the port of Piraeus (Greece). The solution for sea border was developed by the Consortium as a response of the specific needs of cruise ships travels: in such a scenario, 3000 to 4000 passengers are disembarking from a ship, posing evident challenges in terms of speed, security and efficiency of the border control. The passengers of these cruise travels are different from those from the airline traffic. Furthermore, the cruise ships can be targets of illegal migration. Finally, from the perspective of the infrastructure manager, the investment in ABC, especially for smart harbours, must remain low.

The FastPass demonstration at Piraeus proposed an innovative way to cope with these issues, while covering a large variety of cruises courses (from and to Schengen). The solution is based on a single registration, a nominal list enhanced with biometric token and a lightweight designed moveable hardware. The demonstration was running live during a couple of weeks before the visit of the expert. The latter could also observe voluntary passengers using the installations.

The demonstration and many of its processes and components have a good potential for becoming the basis for further developments in the area of automatic border control process for cruise ship passenger at Schengen Borders. Following the positive results, the Consortium plans therefore to disseminate them more broadly towards relevant stakeholders in the cruise ship industry.

Visit of the Expert at the FastPass air border demosite, 16th November 2016
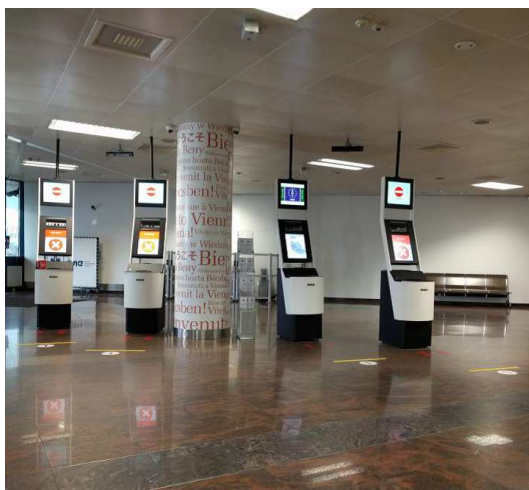
Overview of the FastPass installation at the Vienna Airport (Austria): kiosks at the border control hall (left side); egates (on the right side) . © FastPass consortium

In the same line as the visit of the FastPass sea border demonstration, an external expert has been appointed on 15th November 2016 to observe the demosite installed at the Airport of Vienna by the FastPass Consortium. The partners have developed a scenario which encompasses different border control concepts (mantrap, kiosk) in one architecture and one location. The aim is to enable an easier comparison of those concepts, which has not been done at the European level so far. At the same time, the FastPass solution proposes innovative processes (face and passport as a token) and provides a holistic security baseline.

The demonstration was open to voluntary passengers (EU citizens and Third Country Nationals) a couple of weeks before the visit of the expert and has run until the 16th December 2016. It has gathered more than 3000 passages per configuration, which is a meaningful dataset. The different stakeholders involved in the process have also stressed their satisfaction with the demonstration, which confirms the quality of the work done by the FastPass team.

The feedback on the findings for the installation on air border was also very positive. Indeed, the objectives in terms of innovation, comparison of different concepts in one environment and security analysis were reached. These achievements can therefore constitute a very interesting basis for the

community for further research and developments concerning those topics.

Visit of the Expert at the FastPass land border demosite, 16th December 2016
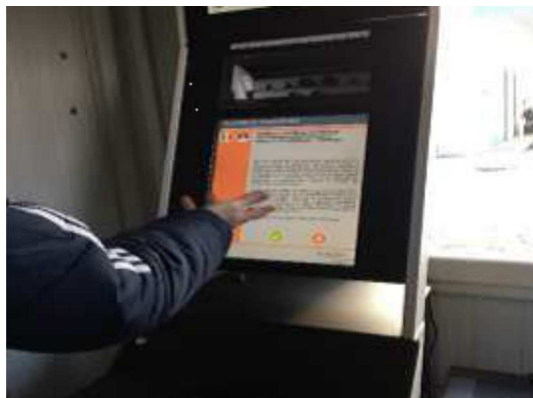
Overview of the FastPass installation at the land border crossing point in Moravita (Romania): kiosk for enrolment in the booth (left side); device for document scanning and face capture (on the right side) . © FastPass consortium

The third FastPass demonstration, located in Moravita, Romania, was visited by the expert appointed by the EU on 15th December 2016. This installation was located on a land border crossing point, which sets a certain number of challenges. The Consortium decided to develop a solution for land border control where passengers of a car could remain seated, which is a requirement from the Schengen Borders Code. Observing that there are very few examples of automated border control for cars or trucks and that the terminal type ABC is not convenient for such a scenario, the FastPass team created an innovative concept based on two steps. In the first one, the passenger will enroll via a kiosk. In a second step, the car will cross the border in front of a device ensuring the document scanning and face capture. The information collected on the device will be compared with the one gathered at the kiosk and enables the passenger to pass the border.

All in all, the trial showed clear improvements in the automation of several steps of an automated border check process. More specifically, the trail shows advances in identity control, where local weather, representing a specific challenge for the technologies (like unstable light conditions for example) did not have a significant impact on the functioning of the system. Moreover, it shows how interaction with passengers sitting in their cars can be achieved. The technological readiness of several parts of the border control process has improved - and can be even more developed. In that sense, the FastPass demonstration represents an interesting proof-of-concept that is a sound basis for future research and implementations.

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CROSS-EYED 2016 - First Competition on Iris Periocular Recognition

The first Iris/Periocular Recognition Competition was embraced by *BTAS'16 – 8th International Conference on Biometrics: Theory, Applications, and Systems*. The CROSS-EYED competition was launched in February, 2016 and ran until the end of April when the final results were made public.

The Cross-Eyed initiative aims at increasing the usability of ocular recognition technologies on generic devices and diversified scenarios. Border control security is targeted by investigating the possible benefits of matching images from two spectrums and captured in at-a-distance and on-the-move scenarios. A typical scenario for a real world application, such as the use in automatic borders, could be one where an enrolment is done in an environment where expensive hardware and near infrared illumination is available and a verification is made using iris images captured in less constrained environments under visible light imaging.

The problem of iris and periocular (the region around the eye) recognition *across* spectra was the one targeted by the CROSS-EYED competition. The main challenge was to match iris/periocular images captured in the near infrared (NIR) and the visible (VIS) wavelengths. As a benchmark dataset the iris and periocular images captured using a custom made dual spectrum imaging sensor were provided.

The winning teams for both tasks were awarded at *BTAS'16* in Niagara Falls on 8th September 2016. The HH team, led by Fernando Alonso-Fernandez, from Halmstadt University (Halmstadt, Sweeden) received the award regarding the periocular recognition task. The NTNU team, led by Kiran B. Raja, from The Norwegian Biometrics Laboratory (Gjovik, Norway) was awarded for the iris recognition task. The presence of our research group in this conference was complemented by the presentation of a poster reporting the competition achievements.

The winning team: Fernando Alonso-Fernandez from the HH team (top -left); Raghavendra Ramachandra from the NTNU team (top-right); Ana Sequeira (bottom).

A scientific paper [1] releasing the database to the academic community, presenting the methods submitted and the results obtained in the competition was published and presented at the BIOSIG conference in Darmstadt, on 28th September 2016.

Besides the importance of releasing new datasets to the research community, this competition has a main goal to record recent advances in iris and periocular recognition through the contributions of participants. To the date, the dataset was already requested by over 20 researchers from all over the world. Additionally, it is rejoicing to note that the results obtained by the participants were very competitive when compared with the current state-of-the-art methods on these problems.

As a first edition of a new competition, covering an emerging topic, the Cross-Eyed 2016 competition received submissions from four teams. Nevertheless, the challenge was launched and we expect that the interest that arose from this pioneer initiative will motivate a larger participation in any future editions. A new edition of the competition is already launched and will be embraced by the IJCB'17: International Joint Conference on Biometrics, October 1 - 4, 2017, Denver, Colorado, USA.

[1] Ana F. Sequeira, Lulu Chen, James Ferryman, Fernando Alonso-Fernandez, Josef Bigun, Kiran B. Raja, R. Ramachandra, Christoph Busch, Peter Wild. **Cross-Eyed - Cross-Spectral Iris/Periocular Recognition Database and Competition,** 15th International Conference of the Biometrics Special Interest Group (BIOSIG) 21.-23.09.2016, Darmstadt.

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