

FASTPASS NEWSLETTER #8

Summer 2015



FastPass advances biometrics at the border

The University of Reading presented two papers at the 7th IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS 2015) in September 2015 in Arlington, US. A third paper was presented at the 14th International Conference of the Biometrics Special Interest Group (BIOSIG) held in September 2015 in Darmstadt, Germany. BTAS and BIOSIG, which are held annually, are two of the main conferences in biometrics.

The first paper the Reading team presented at BTAS was on periocular recognition, which is a new biometric research topic that identifies a person using only the region around their eyes. This is particularly important for situations where the facial recognition is largely covered or occluded and long-distance iris capture fails. The presented work combines 2D texture features and the 3D shape of the periocular region (Figure 1). The method was evaluated on a 3D face dataset that contains various challenging cases in facial expression, head pose and partial occlusion. 3D shape showed its strength and robustness for identifying people using only a small periocular region. In real life situations in ABC, face and iris recognition could fail. Adding periocular recognition can contribute to increased overall recognition accuracy.

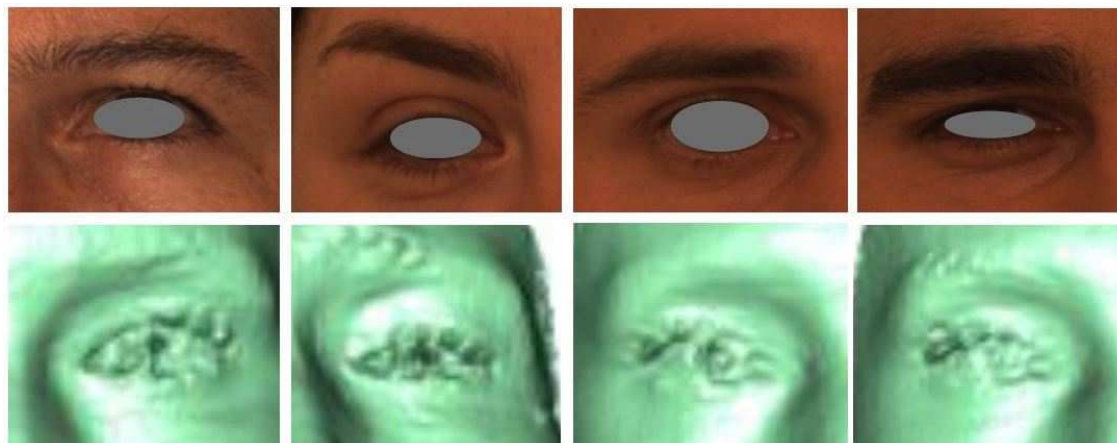


Figure 1 Examples of periocular region data in 3D and 2D- top row: colour images; bottom row: rendered 3D images. Source: A. Savran, N. Alyuz, H. Dibeklioglu, O. C. Elikutan, B. Gokberk, B. Sankur, and L. Akarun. Bosphorus Database for 3D Face Analysis. In *Biometrics and Identity Management*, volume 5372, pages 47–56. 2008.

The second paper presented at BTAS was on sclera segmentation. Sclera segmentation has been shown to be of significant importance for eye and iris biometrics. Reliable sclera segmentation can significantly improve and simplify more complex tasks such as iris segmentation and gaze tracking. The proposed work relies on machine learning techniques to robustly detect the pixels that belong to the sclera region

without employing conventional constraints. For the proposed sclera segmentation method, a robust two-stage classification stage is employed, which is robust to changes in illumination and skin colour. The proposed method was ranked 1st in Sclera Segmentation Benchmarking Competition 2015, part of BTAS 2015, with a precision of 95.05% corresponding to a recall of 94.56%.

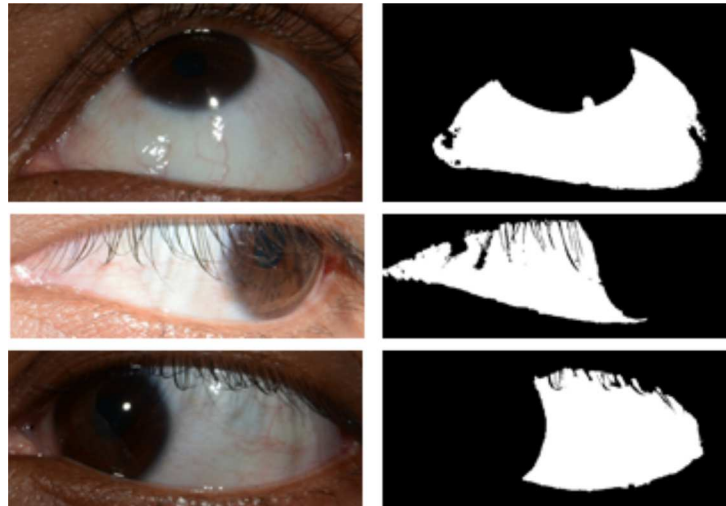


Figure 2 Output of the sclera classification algorithm for different gaze directions. Source: SSBC 2015 database

The third paper presented at BIOSIG focused on iris recognition, specifically multi-segmentation fusion. In ABC on-the-move and less constrained iris capture conditions, iris verification can be as low as 45%. Image quality has shown to play a critical role in the segmentation and normalisation process. Hence this work investigates the potential of fusion at normalisation/segmentation level based on multi-segmentation fusion investigating the benefit of combining the segmentation result of multiple normalisation algorithms. Based on application of four segmentation algorithms to two public iris datasets it is shown that iris recognition accuracy is highly sensitive to the type of errors made by the segmentation algorithms.

All these papers can be consulted on our [FastPass website](#).



ISBC 2015: a real success!

On August 25th 2015 was held the 1st International Workshop on Identification and Surveillance for Border Control (ISBC 2015) in conjunction with the 12th edition of the IEEE AVSS (Advanced Video- and Signal-based Surveillance) conference, Karlsruhe/Germany.

The workshop, co-organised by AIT and the University of Reading, and supported by the European

Association of Biometrics, eu-LISA and the Biometrics institute, brought together a range of researchers, practitioners, and industry of biometric and/or monitoring/surveillance technologies in ABC to share innovative ideas and solutions in biometrics and surveillance for ABC. Particular highlights of the workshop included a panel discussion on “Automated Decision Making for Border Guards” with distinguished representation from eu-LISA (Ciaran Carolan), KU Leuven (Diana Dimitrova) and the University of Milan (Enrique Muñoz Ballester), and the best paper award presented to *Raghavendra Ramachandra and Christoph Busch (Fraunhofer IGD, Germany) for their work entitled “Improved Face Recognition by Combining Information from Multiple Cameras in Automatic Border Control System”*. Given the success of the first workshop, a second workshop is planned to be held in conjunction with the next AVSS in Colorado Springs, USA, in August 2016.



Pictures of the panel session and the audience (upper left and right). Below, a picture of the winner of the ISBC Best Paper Presentation- © FastPass Consortium

Meeting of the FastPass Sea Border Task Force in Piraeus, Greece

On a very sunny September day (36° Celsius), members from the FastPass Sea Border Group met with local stakeholders from the port of Piraeus, Greece to discuss the installation of one of the FastPass demonstration there. The port of Piraeus is the largest passenger port in Europe with over 20 million passengers annually and therefore provides an excellent opportunity for hosting the FastPass ABC demonstrator for sea borders.

When large ships and ferries arrive at the port, thousands of travelers have to be checked at once, while keeping delays at a minimum. This will be a special challenge for the FastPass system and the deployment of the demonstrator will help to gain many interesting insights. Before the actual meeting started, the members of the FastPass Sea Border Group were allowed to inspect potential deployment sites for the demonstrator.

The meeting, which was joined by Greek stakeholders from the port, the Hellenic border police and a cruise ship company, had a quite ambitious agenda. A very important topic was the physical location of the gate, as many different aspects have to be taken into account. Of course the gate should support the work of the border guards, hence it is very important that it does not disturb the regular daily operations. It also must be placed visibly so that travelers know that the gate exists and can be used.

Altogether, the meeting led to a fruitful discussion and as a result, a clear roadmap on how to proceed with the FastPass Sea Border demonstrator in Piraeus has been created.



A cruise in which a FastPass kiosk could be installed for the demonstration - © FastPass Consortium

A fruitful participation in the EAB-Research

Project Conference

Organised this year again under the umbrella of the European Association for Biometrics, the EAB-Research Project Conference was a very constructive event, which took place in Darmstadt (Germany) on 7th and 8th September 2015. The aim was to bring together several representatives of diverse European research projects – namely FIDELITY, BEAT, FutureID, MobilePass, Eksistenz, PCAS, PIDaaS, ORIGINS, ABC4EU, SIIP, PARIS, INGRESS, HECTOS and FastPass- in order to present the work achieved by these Consortia and its impact on the society. Rafael Tesoro (EC- DG CNECT) and Paolo Salieri (EC – DG Migration and Home Affairs) were also present and could highlight the current and future objectives of the European Commission in terms of research.

The above mentioned projects are dealing with border control, speaker identification or template protection: consequently, the core topics discussed were biometrics and identity management. FastPass presented its views on these points, highlighting its last achievements. The presentation held at this occasion can be freely consulted on the [FastPass website](#) for more information. Further fruitful discussions were held at this Conference, which augurs other constructive exchanges for the next EAB-RPC, to be held on 19-20 September 2016!

Meet the Consortium!

The FastPass Consortium will be represented at the Amsterdam Privacy Conference on 23 -26 October 2015 at Amsterdam, Netherlands.



Members of the FastPass Consortium will be present at the Biometrics 2015 (13-15 October 2015, London).



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