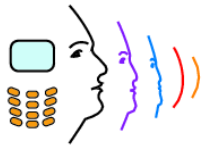


MOBIO

Mobile Biometry

http://www.mobioproject.org/

Funded under the 7th FP (Seventh Framework Programme)
Theme ICT-2007.1.4 [Secure, dependable and trusted Infrastructure]

WP 1: Management

Quarterly Report 4, 2010

Period: October-December 2010 **Submission date:** 02/01/2011
WP Manager: Sebastien Marcel **Revision:** 1

Author(s): V. Devanthery (IDIAP)

Project funded by the European Commission in the 7th Framework Programme (2008-2010)		
Dissemination Level		
PU	Public	No
RE	Restricted to a group specified by the consortium (includes Commission Services)	Yes
CO	Confidential, only for members of the consortium (includes Commission Services)	No

Contents

1 Activities Overview of your WP

During this fourth reporting period, the MOBIO management team:

- updated the website to publish the MOBIO public deliverables,
- prepared the organization of the final review meeting in London (October 22, 2010),
- prepared the organization of the MOBIO booth at the event Biometrics 2010 in London (October 19-21, 2010),
- answered the requests of the reviewers regarding their comments after the review meeting,
- oversaw the implementation of the recommendations made by the reviewers.

2 Description of 3 month activity

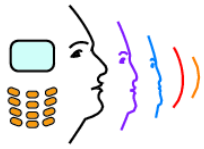
- the MOBIO website is regularly updated with the new public deliverables and other news to communicate
- prepared the organization of the MOBIO booth at the event Biometrics 2010 in London (October 19-21, 2010). MOBIO was present at Biometrics2010 in different ways: first with a booth showing the project results and demonstrators, secondly with three talks at the Conference, and finally with a dinner gathering project and CoI members. The event was held in the Queen Elizabeth II Conference Centre, Broad Sanctuary, Westminster, London SW1P 3EE, UK (http://www.biometrics.elsevier.com). We invited our Project Officer and the reviewers to attend to these conferences and to the exhibition. At the end of this event, they will stay in London for the MOBIO Final Review Meeting which is organised the following day.
- organisation of the MOBIO Final Review Meeting: This meeting took place at the Crowne Plaza Hotel, 45-51 Buckingham Gate in London on Friday October 22, 2010.
- Oversaw the application of the recommendations made by the reviewers to go in the right direction with the project: we keep in mind the recommandations and we are still making sure that all future developments are in the direction of the recommandations.

3 Publications

Not applicable

4 Miscellaneous

Not applicable



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Funded under the 7th FP (Seventh Framework Programme)
Theme ICT-2007.1.4 [Secure, dependable and trusted Infrastructure]

WP 2: Use cases, Specifications and Databases
Quarterly Report 4, 2010

Period: October - December 2010 **Submission date:** 02/01/2011
WP Manager: Christopher Mc Cool **Revision:** 1

Author(s): C. McCool (IDIAP), S. Marcel (IDIAP)

Project funded by the European Commission in the 7th Framework Programme (2008-2010)		
Dissemination Level		
PU	Public	No
RE	Restricted to a group specified by the consortium (includes Commission Services)	Yes
CO	Confidential, only for members of the consortium (includes Commission Services)	No

Contents

1 Activities Overview of your WP

For the fourth quarter of 2010 the goals of this work package was to make the MOBIO database available along with finalised protocols. In addition to this work was done to expand upon the description of the database to make it known to the research community.

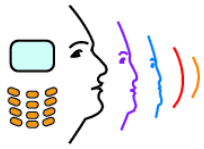
2 Description of 3 month activity

There priority for the fourth quarter of 2010 was to finalise and make the MOBIO database publically avaiable. The website to obtain the database was made public and is currentl viewable at the following address `http://www.idiap.ch/dataset/mobio`. The link is available from the main MOBIO website as well as the main IDIAP website (`http://www.mobioproject.org/` and `http://www.idiap.ch/search?SearchableText=database`).

Accompanying the database are the protocols and a brief description of the database. The protocol files the way in which the database can be used to produce results and the description of the database provides the description of the database and its protocols. The brief description of the database is being expanded into a Journal paper with input from the MOBIO partners.

3 Publications

4 Miscellaneous



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Funded under the 7th FP (Seventh Framework Programme)
Theme ICT-2007.1.4 [Secure, dependable and trusted Infrastructure]

WP 3: Uni-Modal Segmentation and Authentication
Quarterly Report 4, 2010

Period: October - December 2010 **Submission date:** 02/01/2011
WP Manager: T. Cootes **Revision:** 1

Author(s): Prof. T. Cootes (UMAN)

Project funded by the European Commission in the 7th Framework Programme (2008-2010)		
Dissemination Level		
PU	Public	No
RE	Restricted to a group specified by the consortium (includes Commission Services)	Yes
CO	Confidential, only for members of the consortium (includes Commission Services)	No

Contents

1 Activities Overview of your WP

Biometric authentication using mobile devices is becoming a convenient and important means to secure access to remote services such as telebanking and electronic transactions. Potential biometrics for authentication include facial appearance and speech characteristics. This work package addresses the need for improved accuracy in these two arenas by developing novel algorithms for: face detection; facial feature localization; face authentication; voice activity detection; and speaker authentication.

Later work packages address the problems of: fusing these two biometrics to improve authentication performance beyond that of either biometric alone (WP4); model adaptation for learning from unlabelled data and tracking changes in the biometrics over time (WP4); scaling each system to fit within the constraints of a mobile device (WP5); and integration into a working demonstrator (WP6).

1.1 Roles of the partners

The roles of each partner are as follow:

- **IDIAP**: Face detection and face authentication.
- **UMAN**: Facial feature localization.
- **UNIS**: Face authentication.
- **UOULU**: Face detection and face authentication.
- **UAPV**: Voice activity detection and speaker verification.
- **BUT**: Voice activity detection and speaker verification.

2 Description of 3 month activity

Following a successful integration of the systems, promotional activities and completion of a study into system scalability, UMAN revisited its unimodal facial feature localization algorithm in order to gain a deeper understanding of the algorithm's properties and develop the algorithm further.

- When collecting training examples from a dataset, we displace the shape from its true position and sample the underlying image. As a result, pixels from the background are sampled as well as those on the face. For datasets with a fixed background (*e.g.* XM2VTS), this may result the algorithm learning the relationship to the background such that testing on a different dataset performs poorly. To address this problem, we have modified the method to mask out background pixels and replace them with random values instead.

- When training a linear regressor, the problem is not well constrained for high resolution samples: even if we did draw enough samples to make the problem well-conditioned, the computational expense may be too great for a practical system. To date, we have instead projected samples (via PCA or Haar-like features) onto a lower dimensional subspace in which to learn the regressor. There are, however, alternative methods of projection such as Partial Least Squares and Canonical Correlation Analysis that may prove more accurate for this task and we have started to investigate these options.

- One parameter that trades accuracy for efficiency is the number of iteration applied at each level of the sequence: more iterations should improve accuracy but be less efficient. This relationship, however, is less clear in situations such as when using a piecewise constant regressor where a local minimum is not guaranteed (since the output of the regressor may be non-zero for the whole domain, in contrast to a linear regressor). Even when using a linear regressor, the algorithm could settle into an oscillatory state, repeatedly flipping from one solution to another. We therefore looked at how the number of iterations affects accuracy, particularly checking that the algorithm converged to a solution.

- We looked at ways to modify the sampling density of the underlying image such that regions of interest (*e.g.* the eyes, nose and mouth) were sampled more densely than regions of low texture (*e.g.* the cheeks). This work remains ongoing but shows potential.

- Filtering the image before sampling has demonstrated improved performance in previous studies. We are looking at the computational cost of such filtering operations and whether they would be worth the expense on the mobile platform.

- We have applied a 3D model of facial appearance variation to the MoBio dataset in order to estimate identity parameters and therefore evaluate its accuracy and utility for facial verification from video.

3 Publications

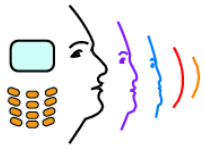
3.1 In Press

[1] P. A. Tresadern, P. Sauer, and T. F. Cootes. Additive update predictors in Active Appearance Models. In *British Machine Vision Conference*, September 2010.

3.2 Under Review

[1] P. A. Tresadern, M. C. Sauer, and T. F. Cootes. Real-time facial feature tracking on a mobile device. *International Journal of Computer Vision*, submitted October 2010.

[2] P. A. Tresadern, *et al.* Mobile Biometrics (MoBio): Joint face and voice verification for a mobile platform. *IEEE Pervasive Computing Magazine*, submitted December 2010.



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Theme ICT-2007.1.4 [Secure, dependable and trusted Infrastructure]

WP 4: Joint Bi-Modal Authentication and Model Adaptation

Quarterly Report 4, 2010

Period: October - December 2010 **Submission date:** 02/01/2011
WP Manager: N. Poh **Revision:** 1

Author(s): Dr N. Poh (UNIS)

Project funded by the European Commission in the 7th Framework Programme (2008-2010)		
Dissemination Level		
PU	Public	No
RE	Restricted to a group specified by the consortium (includes Commission Services)	Yes
CO	Confidential, only for members of the consortium (includes Commission Services)	No

Contents

1 Activities Overview of WP4

Biometric authentication using mobile devices is becoming a convenient and important means to secure access to remote services such as telebanking and electronic transactions. Such an application poses a very challenging pattern recognition problem: the training samples are often sparse and they cannot represent the biometrics of a person. The query features are easily affected by the acquisition environment, the user's accessories, occlusions and aging.

The objectives of this WP are to tackle the above problems in two fronts:

- **Joint bimodal authentication**: to develop a novel fusion mechanism to combine the face and speech biometrics
- **model adaptation**: to investigate model adaptation techniques, or semi-supervised learning, i.e., learning from the vast unlabeled query/test data

The roles of each partners are as follow:

- **UNIS**: to coordinate the activities in WP4 and to design mechanisms for adaptive face and speech systems as well as experiments for their evaluation
- **IDIAP**: to study baseline fusion (D4.1 and D4.2) and joint bimodal fusion via feature level fusion (D4.3 and D4.4) as well as working with UNIS on and adaptive systems (D4.5 – D4.8)
- **UAPV**: to deliver an adaptive speech system for D4.5 as well as D4.7.
- **UMAN**: to provide a support for facial annotation needed for the adaptive systems (D4.7 – D4.8)
- **BUT**: to provide phoneme conditioning for speaker verification system (with no obligation)
- **UOULU**: none

2 Description of Three-month activity

All deliverables in WP4 were submitted in the last quarter. There is therefore nothing to report in this quarter.

3 Publications

Past contributions relevant to this work package include the following:

- Survey on the state-of-the-art biometric [1]
- Selecting a subset of biometrics system for fusion [4]
- Adressing the missing modality problem at the fusion level [9].
- Quality-based multimodal biometric fusion with cross-device matching [3]
- Four challenges and research directions for multimodal adaptive biometric systems have been identified [10]. This paper won the Best Paper awards in the past Int'l Conference on Biometrics (ICB2009).
- Score- and model-level adapatation for biometric systems (ICPR2010) [5].
- A procedure to integrate the quality information into an existing biometric system by compressing the quality measures via a linear projection (Locality Preserving Projection), presented in CVPR2010 [2].
- *Adaptive* strategies:
  - Cohort-based score normalization:
    - An improved version of a client-specific score normalization (F-norm) exploiting a set of cohort models, called "adaptive Fnorm" [7].
    - A score normalization procedure realized using logistic regression which combines T-normalized scores and quality measures [6].
  - Client-based score normalization: A group-based score normalization where a client is assigned to one of the four possible groups [8].
- Another way of adapting the system to the user is by means of human-computer interaction. In [13], we propose to feed the quality information about the quality of an acquired face image back to the user.
- Feature-level cross-modality fusion [11, 12]

References

[1] J. Kittler and N. Poh. Multibiometrics for identity authentication: Issues, benefits and challenges. In *IEEE Conference on Biometrics: Theory, Applications and Systems*, pages 1–6, Washington, D.C., 2009.

[2] K. Kryszczuk and N. Poh. Handling high dimensionality in biometric classification with multiple quality measures using locality preserving projection. In *IEEE Computer Society Workshop on Biometrics, CVPR2010*, pages 146–153, 2010.

[3] N. Poh, T. Bourlai, and J. Kittler. Quality-based score normalisation with device qualitative information for multimodal biometric fusion. *IEEE Trans. on Systems, Man, and Cybernatics (part B)*, 40(539–554), 2010.

[4] N. Poh and J. Kittler. On Using Error Bounds to Optimize Cost-sensitive Multimodal Biometric Authentication. In *Proc. 19th Int'l Conf. Pattern Recognition (ICPR)*, pages 1–4, 2008.

[5] N. Poh, J. Kittler, S. Marcel, D. Matrouf, and J-F. Bonastre. Model and score adaptation for biometric systems: Coping with device interoperability and changing acquisition conditions. In *Int'l Conf. on Pattern Recognition*, pages 1229–1232, 2010.

[6] N. Poh, A. Merati, and J. Kitter. Making better biometric decisions with quality and cohort information: A case study in fingerprint verification. In *Proc. 17th European Signal Processing Conf. (Eusipco)*, pages 70–74, Glasgow, 2009.

[7] N. Poh, A. Merati, and J. Kittler. Adaptive client-impostor centric score normalization: A case study in fingerprint verification. In *IEEE 3rd Int'l Conf. on Biometrics: Theory, Applications, and Systems (BTAS)*, pages 1 –7, Washington, D.C., 2009.

[8] N. Poh, A. Rattani, M. Tistarelli, and J. Kittler. Group-specific score normalization for biometric systems. In *IEEE Computer Society Workshop on Biometrics, CVPR2010*, pages 38–45, 2010.

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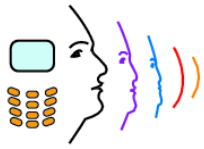
[10] N. Poh, R. Wong, J. Kittler, and F. Roli. Challenges and research directions for adaptive biometric recognition systems. In *LNCS 5558, Proc. of the 3rd Int'l Conf. on Biometrics*, pages 753–764, Sardinia, 2009.

[11] A. Roy and S. Marcel. Crossmodal matching of speakers using lip and voice features in temporally non-overlapping audio and video streams. In *Int'l Conf. on Pattern Recognition*, pages 4504–4507, 2010.

[12] A. Roy and S. Marcel. Introducing crossmodal biometrics: Person identification from distinct audio & visual streams. In *IEEE Int'l Conf. on Biometrics: Theory, Applications, and Systems (BTAS)*, pages 1–6, 2010.

[13] R. Wong, N. Poh, J. Kittler, and D. Frohlich. Towards inclusive design in mobile biometry. In *Int'l Conf. on Human System Interaction (HSI)*, pages 267–274, 2010.

4 Miscellaneous



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Theme ICT-2007.1.4 [Secure, dependable and trusted Infrastructure]

WP 5: Scalability

Quarterly Report 4, 2010

Period: October - December 2010 **Submission date:** 02/01/2011
WP Manager: J-F. Bonastre **Revision:** 1

Author(s): Christophe Lévy

Project funded by the European Commission in the 7th Framework Programme (2008-2010)		
Dissemination Level		
PU	Public	No
RE	Restricted to a group specified by the consortium (includes Commission Services)	Yes
CO	Confidential, only for members of the consortium (includes Commission Services)	No

Contents

1 Activities Overview of your WP

The use of biometric authentication systems on mobile device requires high level of performance with limited resources. Limited processor performance, energy consumption and memory capacity are important examples of such limitations.

Development of biometric system scalability allows to deal with such constraints. The scalability study will investigate a number of important parameters taking into account the cellphone specifications or the amount of transferred data.

2 Description of 3 month activity

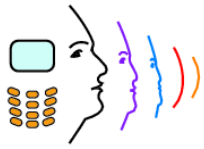
During this period, there is no activitie related to WP5.

3 Publications

none

4 Miscellaneous

none



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Funded under the 7th FP (Seventh Framework Programme)
Theme ICT-2007.1.4 [Secure, dependable and trusted Infrastructure]

WP 6: Demonstration
Quarterly Report 4, 2010

Period: October - December 2010 **Submission date:** 02/01/2011
WP Manager: Markus Turtinen **Revision:** 1

Author(s): Dr Markus Turtinen (VISI)

Project funded by the European Commission in the 7th Framework Programme (2008-2010)		
Dissemination Level		
PU	Public	No
RE	Restricted to a group specified by the consortium (includes Commission Services)	Yes
CO	Confidential, only for members of the consortium (includes Commission Services)	No

Contents

1 Activities Overview of your WP

For the fourth quarter of 2010 the goals of this work package were to finalize D6.5. In addition, developing the the final prototypes and demonstrating them at Biometrics 2010 exhibition were the main achievents for this period. To summarize, the main tasks were the following

- Testing, finalizing and submitting D6.5
- Revision of the delivery D6.2
- Desinging and implementing use-case demonstrations (mobile + client/server)
- Demonstrate use-case scenarios at Biometrics 2010 exhibition

2 Description of 3 month activity

In Q4, VISI continued the mobile integration and finalized all the remaining components in embedded and client-server solutions. Also the development of final MOBIO prototype was made.

The major part of Q4 was to continue previous work and to implement use-case scenarios. Also, more comprehensive testing on individual biometric modules was made and some minor bug fixes made.

For embedded use-case, VISI implemented the mobile application to allow easy access to web-mail or other web-based services. The demo uses face and speaker verification to bypass username/password queries and allows one-touch access to favourite services making the mobile use of these services more convenient. In the client/server use-case, the mobile terminal is used to access confidential information on the secure server. All the biometrics are performed on the server side and mobile is used for data acquisition. These demonstrations were presented at the Biometrics 2010 exhibition in London.

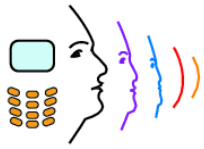
VISI also prepared two video presentations to demonstrate the developed final prototypes. These were shown in the exhibition and afterwads made available on the MOBIO web pages. In addition, consortium participated to the Biometric exhibition as a speaker to discuss about mobile implementation and showed the final prototypes

3 Publications

None.

4 Miscellaneous

None.



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Theme ICT-2007.1.4 [Secure, dependable and trusted Infrastructure]

WP 7: Dissemination and Exploitation

Quarterly Report 4, 2010

Period: October - December 2010 **Submission date:** 02/01/2011
WP Manager: H. Cernocky **Revision:** 1

Author(s): Dr H. Cernocky (BUT)

Project funded by the European Commission in the 7th Framework Programme (2008-2010)		
Dissemination Level		
PU	Public	No
RE	Restricted to a group specified by the consortium (includes Commission Services)	Yes
CO	Confidential, only for members of the consortium (includes Commission Services)	No

Contents

1 Activities Overview of your WP

During this fourth (and final) quarter of 2010, WP7 dissemination activities concerned mainly scientific publications, dissemination to general public, evaluations, Web pages, Community of Interest (CoI), trade fairs and projects related to MOBIO.

An important activity was preparation and presentation of WP7 activities at the final project review in London and delivery of D7.5: Final report on exploitation activities.

2 Description of 3 month activity

2.1 Deliverables

Deliverable "D7.5 Final report on exploitation activities" was prepared and submitted to the Commission.

At this occasion, a summary of scientific dissemination activities in MOBIO was produced:

Publication type	2008	2009	2010	totals
journal	1	2	5	8
book chapter	1	1	1	3
conference paper	13	25	30	68
PhD thesis	0	2	0	2
technical report	0	1	0	1
totals	15	31	36	82

Full list of publications is can be found on MOBIO publication page `http://publications.mobioproject.org/`. Several other papers are under review, accepted or in press and will be published after the formal end of MOBIO 31st December 2011.

2.2 Biometrics2010 London October 2010

MOBIO decided to join one of the major biometric events for its results presentation. The involvement included 3 talks during a MOBIO session within the conference program, a stand at the exhibition (days 2-3) and a table in front of the conference (day 1 unique opportunity).

Demonstration of live prototype resulted in over 80 contact forms from various domains:

- Consultants
- Academic (even one from SecurePhone FP6)
- Biometrics players
  - Safran/Morpho
  - MaxID
  - VoiceKey
  - Cognitec
  - Human Recognition Systems
  - 3M
- Banking-related
  - Diebold

- Security players (ready to buy the demo!!!)
- Operator – FT R&D UK

The feedback from biometric actors was quite positive, and "new" use cases were collected:

- E-voting
- Enrollment of voters in rural areas
- Secure connection
- Enrollment of exams (check if the person attended classes)
- Law enforcement (authenticate policeman on device-authenticate driver/suspect)

2.3 Community of Interest

Last member to join the CoI just before Biometrics 2010 is Yuil Banking & Security Co. Ltd. out of South Korea. Yuil is a high-secured bank-card & payment systems supplier using advanced biometrics (m-Payment).

Here is a summary of the CoI structure and build-up. The full list can be found at `http://www.mobioproject.org/community-of-interest`

Building a Community of Interest based on a new concept has been quite challenging. Without a demonstrator, it has been difficult to raise interest at first:

- Very difficult to reach the right person in a large company (Orange, Nokia,...)
- Individual can't easily sign up for its company
- Large companies often count on SMEs to bring new solutions (mobile operators, Logitech, ...)
- Fear of extra work
- Some see no value to enter that early (Logitech, less technical SMEs)
- Demo helped to convince (seen as of mid-2010)

Companies which joined were from three distinct domains:

- Academic: especially at the beginning
- Mobile
- Biometric

The sources were various and evolved with time:

- Initially, mainly individual networks
- Rerouting (contact on another subject)
- From academic request
- From technology request
- Leads from events (ICT Lyon, MobileMonday, ...)
- Cross-over from other projects (EU, national, ...)
- In 2010, from the teasers and demo videos
- More than 200 contacts (not counting LinkedIn groups)

2.4 Technology Transfer page

As a reference page towards which any lead could be directed, MOBIO created the following Technology Transfer table stating technology by partner and with contact details. This page will remain on-line beyond the project's life. `http://www.MOBIOproject.org/technology-transfer`

2.5 Leads

Following the broadcast of various demos and MOBIO's presence at Biometrics 2010, here is a list of leads by partners:

2.5.1 BUT

BUT and Phonexia (a spin-off of BUT speech group) have signed an agreement on the exploitation of BS-CORE software package. BS-CORE is produced by Phonexia `http://phonexia.com/` in cooperation with BUT. The package includes several algorithms for fast and robust speaker ID that were developed with the help of MOBIO funding.

BUT had talks with NICE (Israel) `http://nice.com/` on the exploitation of BUT speaker and language ID technologies in NICE products. Members of NICE R&D team visited BUT in October 2010.

BUT had talks with Loquendo (Italy) `http://www.loquendo.com` on the exploitation of BUT technologies in Loquendo products. Mr. Luciano Piovano (Vice President, Government Intelligence Solutions) visited BUT in July 2010.

Although BOSARIS'10 (Brno Speaker Recognition Summer Workshop 2010) was primarily an academic event, the industrial participants (Niko Brummer, Agnitio, Spain and Fabio Castaldo, Loquendo, Italy) expressed great interest in the use of its results in commercial environments.

BUT spoke to several industrial and government contacts during Odyssey 2010 (conference organized at BUT, `http://speakerodyssey.com/`), for example Speech Technology

Center, Russia, TNO Human Factors, Netherlands, GoVivace Inc., USA, Raytheon BBN, USA, and others.

BUT extends the work in robust speaker verification by working with SRI International on "PRISM: Promoting Robustness in Speaker Modeling", a project supported by US IARPA under the BEST program.

2.5.2 UOULU

The Local Binary Pattern (LBP) and Local Phase Quantization (LPQ) methods were originally developed at UOULU, and they have formed a basis for many R&D projects in face recognition and related applications.

Visidon is a spin-out company of UOULU - it has contacts dealing with our technology.

UOULU has joint research projects with Nokia Research Center (NRC) related to its technology.

Dr. Timo Ahonen, who was working in MOBIO project, is currently at NRC Palo Alto.

2.5.3 UNIS

UNIS had the following contacts:

- OmniPerception Ltd, 20 Nugent Road, Guildford, UK, contact Dr K Messer
- BAE Systems, Farnborough Aerospace Centre, Farnborough, Hants, UK, contact: Mr D Mullin

2.5.4 UMAN

UMAN has been contacted by four commercial entities, though UMAN cannot reveal their identities due to confidentiality agreements. UMAN have produced a desktop-based demonstration system for one of these companies under a fixed-term software evaluation agreement.

UMAN also have interest from Facetec and Whamoosh who are interested in our latest facial feature tracking software UMAN already have a working relationship with these two companies.

2.5.5 VISIDON

No public information

2.5.6 IDIAP-IDEARK

Commercial licensing or sub-licensing agreements signed for a face and voice authentication SDK

- KeyLemon SA

- Biometry AG
- Symbion Medical Systems SARL

Evaluation licensing agreement signed for a face and voice authentication SDK

- SAFE ID AG

Strong interest in an evaluation SDK for a mobile (which IDIAP will finalize)

- KeyLemon SA
- Biometry AG
- Mobbeel (Spain)
- CPqD (Brazil)
- MetroWaorks (Japan) – mobile detector for security areas
- WiseKey (Switzerland)
- Yuil B&S (Korea + partner in Spain Eureka project) – Multimodal biometrics by Match-On-Card technology
- iD1 Global (Dubai) – biometrics system integrators and solution provider working on different projects from security to customer and consumer access and verification in various deployments. Financial Services Industry. We have requirement for iPhone 4 mobile SDK, options on Embedded Biometry and Remote Biometry)
- BIANOR (Bulgaria and USA)
- Biometria Aplicada (MEX)

Some others contacts:

- Face.com (Israel): interest in database and publications
- HSBC Technology Showcase: interest in MOBIO concept
- Finnova - Swiss banking solution provider: first contact

Patents holder in mobile biometry:

- ICEPAT

3 Publications

Several papers were proposed to conferences and journals. According to the consortium agreement, the abstracts were sent to the MOBIO mailing list. See MOBIO publication web page[1] for updated information.

[1] http://publications.mobioproject.org/

4 Miscellaneous

N/A