Interview with Christoph Busch – Convenor, ISO/IEC JTC 1 SC 37 WG3 – Biometric Data Interchange Formats

In addition to his leadership of SC37 WG3, Dr. Busch is head of the department of Security Technology at the Fraunhofer Institute for Computer Graphics (Fraunhofer IGD) and on their behalf chairs the biometrics working group of the TeleTrusT association as well as the German standardization body on Biometrics (DIN-NIA37). He is also a member of the faculty computer science and media technology at the Gjøvik University College (GUC), Norway with a joint appointment with the media faculty at Hochschule Darmstadt (Darmstadt, Germany). We appreciate his willingness to be interviewed for Planet Biometrics – Standards in Focus.

Interviewed by: Catherine Tilton, Standards Editor

- **Q: What is your role in SC37 and how/when did you get involved?**

  Formally my role as convenor of Working Group 3 (WG3) in SC37 is to compose the agenda and chair the meeting. Essentially it is more than just to mediate between conflicting positions - in various situations my task is also to identify possible roads for our standardization work and once we agree to capture that in a living roadmap.

  I got involved in SC37 at the meeting in Spring 2003 in Canada.

  I must admit that before I joined this ISO/IEC committee I could not understand why some of my colleagues devoted their time to standard meetings. Then after I received an invitation to said meeting I asked a good friend, "Why should I attend such a standardisation meeting?" - and the answer was: "at least you will meet many interesting people". Indeed - I did meet lots of people since then - but moreover I learned the relevance and importance of standards for the benefit of society and thus I am fascinated by that work since.

- **Q: What is the charter of WG3?**

  The task of WG3 is to address the standardization of the content, meaning, and representation of biometric data formats which are specific to a particular biometric technology or technologies. Within the development of these standards, we ensure a common look and feel for biometric data structures, provide platform independence as well as separate transfer syntax from content definition.

  Interchange standards are developed by WG3 for fingerprint (images, pattern, minutiae), face, iris, signature/sign, vascular, hand-geometry, voice and DNA data.

- **Q: How many countries participate in the work of WG3?**

  Over the last three years the meetings of WG3 were attended by 14-19 National Bodies (NBs). The number of experts is in the range of 40 to 60 at each meeting.

Q: Is it difficult for so many countries to achieve consensus?

The large number of NBs participating indicates the relevance of WG3 and a strong interest and associated contributions in the first place. Contributions support the development of a standard. Fortunately the number of opposing positions is not directly correlated to the number of NBs. In reality, NBs are in many cases clustered around certain positions. But finding a consensus among those positions is sometimes not easy - but the core nature of our standardization work. To reach a consensus may take some effort but it is definitely worth the effort.

Q: From your perspective, what are the greatest achievements of this WG?

The WG remains flexible and adapts to the need of the market. In the early years of the WG3 work, a significant achievement was to deliver ISO/IEC 19794 Parts 4 and 5 (finger and face images) in the shortest possible timeframe. The focus of the recent years was to achieve good harmonization across the parts in the recently completed revision process, which resulted in the second generation (G2) of ISO/IEC 19794-x.

Q: And what are its greatest challenges?

The greatest internal challenge is to find every time a good and fair compromise between opposing industry or governmental positions. The greatest external challenges is to be consistent and compliant to the standards developed in other SC37 Working Groups (e.g. the Harmonized Biometric Vocabulary from WG1) and to avoid redundancy with other JTC1 subcommittees such as the work in SC27. By experience, talking with other groups helps efficiently to address those challenges.

Q: Since its inception in 2002, how many data format standards have been published?

I do maintain an updated list of all projects in WG3, which you can find at: http://www.christoph-busch.de/SC37WG3/sc37-wg3-projects.xls.

At the time of this writing, that list contains 74 projects that have been started in WG3. This number includes data format standards, conformance testing standards and amendments and technical corrigenda thereof. Already 40 of those projects are completed and published.

Q: What changes have you seen in biometric standards during this time?

It was only recently, in summer 2008, that we discussed intensively whether our biometric data formats should offer both a binary and a XML encoding. At that time, the suggestion of XML encoding was clearly rejected. Only 3 years later, by summer 2011, XML seems to be one of the hot topics.

Q: What's left to be done?

If you want to know in detail - take a look at the WG3 road-map, which is published as SC37 Standing Document 14-3. From my perspective, we will work in the near future intensively to complete XML encoding and get a stable draft on ISO/IEC 30107, which is addressing suspicious presentation detection. Further, we need to make progress to define a standard for biometric sample quality metrics both for iris images and fingerprint images.

Q: There are 4 different fingerprint standards in the 19794 series. Why?

In fact, there are several sub-formats inside some of these, which may look even more confusing. But the picture becomes clearer if you consider that there are various levels of processing of a biometric

fingerprint sample - starting with the representation of a fingerprint image (19794-4), over the full ridge representation with the fingerprint pattern skeletal data (19794-8), down to the very compact finger minutiae data (19794-2) encoding. 19794-3 can be seen as an alternative to 19794-8 but is not continued by WG3 any longer - i.e., there is no second generation of this part. Further, with respect to the revised parts 2, 4 and 8, we continue to differentiate inside those formats for encoding for compact card formats or the more extensive record format.

Q: How are WG3 standards being used in the real world?

The ICAO estimate as of July 2011 was that there are 345 million ePassports existing, which were issued by 93 states. Moreover, India has already enroled more than 150 million citizens in its UID system for which references are stored in ISO/IEC format. Thus we have already approx. 500 million subjects for which an SC37 WG3 standard was used, in order to encode their biometric reference. I think this is an impressive impact.

Q: Do you have a favorite SC37 standard?

Yes there is one: That is ISO/IEC 19794 and the associated conformance testing and biometric sample quality standards.

:-)

Q: What would you like people to know about SC37/WG3 or its work?

Well - what I have stated above and the information that I update after every SC37 plenary meeting and provide online at: http://www.christoph-busch.de/standards-sc37wg3.html

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Biography

Christoph Busch is member of the faculty computer science and media technology at the Gjøvik University College (GUC), Norway. He holds a joint appointment with the media faculty at Hochschule Darmstadt (Darmstadt, Germany).

He received his PhD in the field of computer graphics in 1997. In the same year he joined the Fraunhofer Institute for Computer Graphics (Fraunhofer IGD) as head of the department Security Technology. Prof. Dr. C. Busch has since been responsible for the acquisition, the management and the control of various applied research and development projects.

On behalf of the German Federal Office for Information Security (BSI) he has been the responsible project coordinator for the project series BioIS, BioFace and BioFinger, BioKeyS Pilot-DB – all projects dealing with biometric applications in general and performance and security testing in detail. In 6th EU research program he was initiator of the Integrated Project 3D-Face. Hed is currently in FP7 partner in the EU-projects TURBINE, BEST Network and FIDELITY. He is also principal investigator in the Center for Advanced Security Research Darmstadt (www.cased.de).

Moreover Christoph Busch is co-founder and member of board of the CAST-Forum that was established in 1999 and assembles in the meantime more than 200 institutional members www.cast-forum.de.

Further he is co-founder and member of board of the European Association for Biometrics www.eab.org that was established in 2011.

Christoph Busch published numerous technical papers and has been a speaker at conferences. He served for various program committees (NIST IBPC, IBC, BSI-Congress, GI-Congress, DACH, WEDELMUSIC, EUROGRAPHICS) and served for several conferences, journals and magazines as reviewer (ACM-SIGGRAPH, IEEE CG&A, IEEE Transactions on Signal Processing, Elsevier Computers & Security, etc.). He is also an appointed member of the editorial board of the IET journal on Biometrics.

Since 2002 Christoph Busch is a member of the steering committee of the BIOSIG Special Interest Group on Biometrics within the Gesellschaft für Informatik (GI). He was elected as chair of the group in 2008.

Furthermore, on behalf of Fraunhofer, he chairs the biometrics working group of the TeleTrusT association as well as the German standardization body on Biometrics (DIN-NIA37). He is active in international standardization committees on Biometrics and is convenor of WG3 in ISO/IEC JTC1 SC37 on Biometrics.