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Information technology — Cross jurisdictional and societal aspects of implementation of biometric technologies — Biometrics and children

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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, SC 37, *Biometrics*.

Introduction

In the growing involvement of children in biometric systems, several issues concerning their use of biometrics appear more critical than to adults.

Most problems rely on the physical and psychological immaturity of children. The bodies of children are still in a growing phase and this may cause difficulties in the biometric capture and comparison processes. For the children themselves, the usability of a biometric system becomes a crucial factor.

On the other hand, their psychological immaturity implies that there could be situations where parent(s) or legal representative(s) have to support them to use biometric systems, especially when data protection or privacy issues are involved.

In this Technical Report, the definition of "child" is considered from the applicative point of view in Clause 5. In Clause 6, studies on biometrics for children are surveyed for certain modalities because the application of biometrics is heavily dependent on the modality. Clause 7 introduces examples of application of biometrics that are typical to children and present clear benefits. Finally, Clause 8 summarizes various elements concerning the protection of children when using biometric systems with particular reference to data protection and psychological concerns.

Examples of the benefits to be gained by using the Technical Report are the following:

— operational support in using biometrics applied to the context of children;

— enhanced acceptance by subjects of systems (children, parents and legal representatives, tutors,…) using biometric technology;

— improved public perception and understanding of these systems;

— smoother introduction and operation of these systems;

— adoption of commonly approved good privacy practice.

The primary stakeholders are identified as follows:

— parents and legal representatives;

— users of the biometric data;

— developers of technical standards;

— subjects who provide the biometric sample;

— requirements analysts;

— system architects;

— IT designers;

— public policy makers.

Any jurisdiction of the country for which the biometric system is intended to shall be considered.

Information technology — Cross jurisdictional and societal aspects of implementation of biometric technologies — Biometrics and children

1   Scope

This Technical Report builds upon the general recommendations given in ISO/IEC TR 24714-1.

It provides guidance for users (as defined in ISO/IEC 2382-37) of biometric recognition systems on specific requirements in relation to deployments when children are included as subjects in the biometric process.

2   Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 2382-37, *Information technology — Vocabulary — Part 37: Biometrics*

3   Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 2382-37 and the following apply.

3.1
child
person below the age of 18, unless the laws of a particular country set the legal age for adulthood younger[1]

3.2
friction ridges
ridges present on the skin of the fingers and toes, the palms and soles of the feet, which makes contact with an incident surface under normal touch

4   Symbols and abbreviated terms

BIODEV	Biometrics Data Experimented in Visa (European Commission funded experimentation, 2005)
BKA	Bundeskriminalamt (Federal Criminal Police Office of Germany)
dpi	dots per inch
EC	European Commission
EER	Equal Error Rate
JRC	European Commission Joint Research Center
MYCHIP	The Masonic Youth Child Identification Program (MYCHIP)

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1)   http://www.ohchr.org/en/professionalinterest/pages/crc.aspx [viewed 12 July 2015].

NCMA	National Center for Missing Adults
NCMEC	National Center for Missing and Exploited Children
NIJ	National Institute of Justice
NIST	National Institute of Standards and Technology (U.S. Department of Commerce)
NMCO	Nation's Missing Children Organization
TNO	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek (Netherlands Organisation for Applied Scientific Research)
UIDAI	Unique IDentification Authority of India (UIDAI)
UNICEF	United Nations Children's Fund

5   Background and rationale

5.1   Definition of "child" in terms of age

The term "child" is generally considered to cover the period between birth and puberty and, from a legal point of view, may be substituted by the term "minor". The concept itself of "minor" is not sharply defined in most jurisdictions. The ages of criminal responsibility and consent, the age at which attendance at school ceases to be obligatory, the age at which legally binding contracts can be entered into, and so on, can all be different.

With regards to the age limit of childhood, the above mentioned convention on the Rights of the Child defines a child as a person below the age of 18, unless the laws of a particular country set the legal age for adulthood younger.

In accordance with the above mentioned convention, for the purpose of this Technical Report, a "child" is an individual up to 18 years although, from a morphological point of view, all the biometrics characteristics can be considered stable at earlier ages.

5.2   Ethical background

The 1959 United Nations Declaration of the Rights of the Child,[1] approved by the United Nations General Assembly, clearly ratifies that, by reason of their physical and mental immaturity, children need special safeguards and care, including appropriate legal protection.

With specific reference to identity management, the principle three of the above mentioned declaration prescribes that "The child shall be entitled from his birth to a name and a nationality".

The importance of the identity in the context of childhood is reinforced by the Articles 7 and 8 of the Convention on the Rights of the Child[2] (20 November 1989, entry into force 2 September 1990), cited also by UNICEF.[3] The articles highlight the obligation of the States Parties to respect the right of the child to preserve his or her identity.

The 1959 United Nations Declaration of the Rights of the Child and the Convention on the Rights of the Child, while ratifying that children shall be the object of special respect and protection, highlight the importance of identity and pave the way to the implementation of biometric recognition systems.

5.3   General considerations

Due to the widespread diffusion of biometrics and to the growing involvement of children in the identity management processes, some concerns have been raised due to the legal, social and ethical aspects encompassed.

Apart from the apprehensions, it should be highlighted that biometrics can assume a straightforward importance for the safety and security itself of children.

Biometrics is an important tool in fighting crimes, such as, human trafficking with a particular reference to children who are often the innocent victims of abuses and violence or even appreciated source of human body organs unscrupulously offered on the terror market.

Other applications of biometrics for children have a different purpose. For example, some school canteens or libraries have introduced a biometric check to verify the identity of children in accessing the services offered.

The target of these applications is the alleviation of potential frauds. In some national jurisdictions, the local Data Protection Commissions can consider this purpose non-sufficient to satisfy the principle of "proportionality".

The proportionality principle refers to a general principle of law that requires in general a fair balance and reasonable relationship between the means requested or used, including the severity and the duration of the means, and the objective sought.[4]

6   Studies on biometrics for children

6.1   General

This Clause analyses some aspects relative to the biometric technologies which have already found an application for children. The text justifies the selection of the biometric modalities in the section.

6.2   Study on age estimation of children

Estimating the age of children in photographic images may be useful in determining whether a child has the same identity as a reported missing child. It may also be of assistance in determining the relative age of exploited children from photographs and videos.

NIST has published a study "Face Recognition Vendor Test (FRVT) Performance of Automated Age Estimation Algorithms". Automated age estimation has applications specific to children, including automated age regression/progression and investigation support to law enforcement. As seen from the most accurate commercial age estimation technology, the average age estimation error for children ages 0 to 14 is approximately 2,4 years.

6.3   Fingerprints

6.3.1   Physiology

Primary dermal ridges2) (ridge counts) are formed during the gestational weeks 12 to 19 and the resulting fingerprint ridge configuration (fingerprint) is fixed permanently.[5]

Despite being fully formed and invariant in numbers of lines, drawings or details (minutiae), ridges do change in size throughout the growth of the child, becoming thicker and widening the gap between them.[6]

Various studies have tried to assess several aspects relative to the use of fingerprint recognition for children. In particular, two issues have been mainly investigated: the minimum age for enrolment and the feasibility of recognizing fingerprints of children after a certain number of years.

Some data about the children's age in which the acquisition of fingerprint may considered significant are reported in 6.3.2.

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2)   The term "dermal ridge" intends "friction ridge", as defined in 3.2.