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FACILITATION (FAL) DIVISION — TWELFTH SESSION

Cairo, Egypt, 22 March to 2 April 2004

Agenda Item 2: Facilitation and security of travel documents and border control formalities
2.2: Biometrics

FACE RECOGNITION FOR IDENTITY CONFIRMATION – INSPECTION OF TRAVEL DOCUMENTS

(Presented by the United States)

1. BACKGROUND

1.1 This paper presents the current status of the evaluation of the effects of ageing (elapsed time between face images) on facial recognition automated identity verification.

1.2 The United States has conducted a series of facial recognition tests starting in 1993, and the results of these tests are publicly available. The tests are identified as FERET, FRVT 2000 and FRVT 2002.

1.3 The most recent test report (FRVT2002) contains a significant analysis of the effects of elapsed time between facial images on the automated identity verification performance (error rates) of many of the current facial recognition products.

1.4 Annex 9, Recommended Practice 3.11, Note 2 acknowledges that due to "the changing appearance of the passport holder over time, a validity period of not more than ten years is recommended".

1.5 ICAO (TAG/MRTD) has specified facial recognition as the globally interoperable biometric technology for machine-assisted identity confirmation.

2. FACIAL RECOGNITION PERFORMANCE WITH AGEING

2.1 Test results indicate that automated matching (one-to-one verification) of facial images with very little time elapsed between images experience false rejection error rates (i.e. a valid claim of identity is incorrectly rejected by the facial recognition system) of 5 per cent (at 1 per cent false accept rate) for the best system tested. (ref. FRTV2002, figure 16, page 26).

2.2 Test results further indicate that increasing the elapsed time between facial images increases the false rejection rate. Data at 38 months difference indicate that the error rates increase to 15 per cent for the best systems tested. (same ref. as 2.1)

2.3 Similar testing and results are documented in a German facial recognition evaluation, "BioFace – Comparative Study of Facial Recognition Systems", section 5.7.5. The elapsed time between images in this study extends to 10 years.

3. IMPACT OF BIOMETRIC APPLICATION ON PERIOD OF VALIDITY

3.1 Facial recognition using automated matching techniques will be instituted as a fundamental part of passport based passenger identity verification. Provisions to handle situations where the automated matching technique does not confirm the identity of the passport holder will be established, but the efficiency and speed of processing passengers will be degraded when the automated matching fails.

3.2 Facilitation of passenger processing could be negatively impacted by delays and additional procedures needed to resolve false rejection errors. The extent of that impact will grow as the elapsed time between facial recognition images increases. The allowable period of validity of the passport can act as a control on the extent of the impact.

3.3 The New Technologies Working Group (NTWG) of the Technical Advisory Group on Machine Readable Travel Documents (TAG-MRTD) is aware of the apparent decline in accuracy of facial recognition due to aging. They are monitoring the testing of each of the biometric identifiers for several performance indicators and will include aging as a significant factor when they prepare their final report.

4. ACTION BY THE DIVISION

4.1 The Division is invited to:

a) note that automated facial recognition performance is clearly related to ageing;

b) consider the impact of facial recognition false rejection errors on passenger facilitation; and

c) refer the issue to NTWG for recommendation through the TAG/MRTD.

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