International Civil Aviation Organization

WORKING PAPER

TECHNICAL ADVISORY GROUP ON MACHINE READABLE TRAVEL DOCUMENTS (TAG-MRTD)

SEVENTEENTH MEETING

Montréal, 20 to 22 March 2007

Agenda item 2:   Work of the New Technologies Working Group (NTWG)
Agenda Item 2.1: Progress and issues

APPLICATION OF PHOTO STANDARDS
IN THE E-MRTD ISSUING PROCESS

Presented by the New Technologies Working Group (NTWG)

1.   **INTRODUCTION**

1.1   Part 1 of ICAO Doc 9303 (6th Edition) references the specifications set out in ISO/IEC 19794-5, Biometric Data Interchange Format - Face Image Data, for the compliance of biometrically suitable passport images.

1.2   Experiences of various issuing authorities that have applied these specifications suggest that a number of key specifications within in the ISO/IEC 19794-5 Standard may need to be modified.

2.   **BACKGROUND**

2.1   At the recent NTWG meetings in Portugal, participants agreed that immediate consideration be given to identifying potential solutions, including revised practices and/or tolerance adjustments, to ensure that issuing agencies are able to meet specifications for "Biometric Data Interchange Format - Face Image Data" within the 6th Edition of Part 1 of ICAO Doc 9303. These modifications will ensure that the best performance is achieved when using said data for machine assisted identity confirmation.

2.2   ISO SC17/WG3 was asked to assist NTWG and to initiate the work program by soliciting Issuing States to summarize any problems they have experienced/or expect to experience in achieving compliance with specifications set out in ISO/IEC 19794-5, Biometric Data Interchange Format - Face Image Data, as referenced in the Sixth Edition of Part 1 of ICAO Doc 9303, Machine Readable Passport.

3**.**   **PRELIMINARY RESULTS**

3.1   The focus of the analysis performed by four high volume e-passport issuing States was largely on whether typical Passport photos meet the key specifications set out in ISO/IEC 19794-5; that being with respect to pose, pixel resolution between the eye centres, head image width ratio, head image height ratio, relative horizontal position and relative vertical position. The data derived from a large scale sampling of different passport issuing agencies suggest that:

  a)   current QA technology is not capable of confirming the accuracy of roll, pitch and yaw to the pose tolerance of $\pm$ 5 degrees as prescribed in the Standard. This makes it difficult if not impossible to automatically isolate images that do not meet the specifications;

  b)   typical passport photos appear to meet the specifications set down in the Standard for pixel resolution between the eyes and relative vertical position of the face;

  c)   typical Passport photos appear to require a slight modification to the specifications set down in the Standard with respect to head image width ratio;

  d)   typical Passport photos appear to require a slight modification to the specifications set down in the Standard with respect to head image height ratio; and

  e)   It would be helpful to include a definitive specification including tolerances within the Standard for relative horizontal face position.

4.   **CONCLUSIONS**

4.1   The NTWG working group suggests keeping the nominal ranges (min/max values) of the above-mentioned criteria as given in ISO/IEC 19794-5, Biometric Data Interchange Format - Face Image Data, unchanged. This will guarantee solid ground, backward compatibility for already issued MRTDs and will still be within (theoretically) the optimal range of these criteria.

4.2   For the application of these nominal ranges by e-passport issuing agencies, especially for the automated image quality assurance by software tools, it is suggested to define acceptable tolerances around those ranges for all the important criteria given in ISO/IEC 19794-5.

4.3   Where those tolerances are already defined in ISO/IEC 19794-5, it is suggested to slightly relax them in the above-mentioned manner in order to maintain a smoothly running issuance process.

4.4   In order to avoid a possible degradation in facial recognition performance it is suggested to keep the specification for pixel resolution between the eye centres unchanged at a minimum 90 pixels, as already given in the current version of ISO/IEC 19794-5.

5.   **NEXT STEPS RECOMMENDATION**

5.1   **Complete the analysis**.

5.1.1   A follow-up work program, more information by other issuing States will be gathered to identify specifications contained in ISO/IEC 19794-5 that are posing difficulties for achieving compliance given the unique needs of the MRTD issuance process. The results will be published.

5.2   **Publish the recommended adjustments in the Supplement.**

5.2.1   The summarized outcome of the work and the recommendation that a number of adjustments be made to the key specifications set out in ISO/IEC 19794-5 shall be published in the Supplement of ICAO Doc 9303.

5.3   **Amend the ISO/IEC 19794-5 standard**.

5.3.1   Using the liaison mechanism via ISO SC17/WG3 and ISO SC37/WG3, the NTWG will approach the appropriate standards bodies to amend ISO/IEC 19794-5, taking into account the needs of the issuing authorities to maintain a smoothly running issuance process while at the same time avoiding degradation in facial recognition performance.

5.3.2   The SC 37 WG 03 defect report editing group for ISO/IEC 19794-5 is to be supported in their task to prepare a Draft Technical Corrigendum to ISO/IEC 19794-5.

6**.**   **ACTION BY TAG/MRTD**

                The NTWG invites the TAG/MRTD:

        a)   to acknowledge the preliminary analysis and conclusions on the application of ISO/IEC 19794-5 specifications to the e-MRTD issuing process;

        b)   to approve the continuation of the on-going research in this area; and

        c)   to approve the proposed next steps.

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