MORPED PASSPORT PHOTO DETECTION BY HUMAN OBSERVERS

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Abstract

Introduction: The use of fraudulent passports for identity verification represents a significant threat to national security. Modern passports contain counterfeit prevention measures (e.g., printed patterns visible only under specific artificial illumination) which make any attempts to alter or duplicate the document itself unlikely to go unnoticed. As a result, fraudsters are now known to be focusing on obtaining FOG (fraudulently obtained but genuine) passports. FOG passports are real documents which are wrongly issued to fraudulent applicants, and they arise when a confederate, who holds a genuine passport, submits a renewal application with the photo of a similar looking client. If the mismatch between the renewal image and the image held on file goes undetected, a FOG passport is issued which can be used illegally by the client individual. In a recent advancement in this approach, criminals are seeking to increase their success rate by submitting a morphed passport photo, an image of the confederate and the client which has been digitally blended together and which retains a likeness of both individuals. Border security agencies have only recently detected the use of passport morphs, and research is required to ensure that the relevant agencies and practitioners stay one step ahead of these criminal attacks. Here we use applied psychological science to quantify morph detection rates, to assess the effectiveness of a morph detection training task, and to evaluate the use of individuals who show a high aptitude on a test of unfamiliar face matching as a potential countermeasure.

Methods: Across two published studies and a total of four experiments, we assess passport morph detection in human observers, both in a 'spot the morph' task and in a passport matching context (i.e. match, mismatch or morph decision).

Findings and Argument: Across these experiments we show that morph detection rates are often at or near chance level across tasks, that facial identification aptitude as measured by the Glasgow Face Matching Test (GFMT) and the Models Face Matching Test (MFMT) only partially predict morph detection performance, suggesting that super-recognisers may be only a moderately effective counter-measure, and finally we show that rudimentary morph awareness and detection training can significantly increase detection rates.

Conclusion and Recommendations: From our studies, we conclude that morph detection is a challenging task and one which is highly prone to error. However, effective counter-measures, at least for human observers, include morph awareness information, training, and the selection of individuals with a natural aptitude for facial identification (i.e. super-recognisers).

References

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Keywords

Passport Morphs, Identity Fraud, Face Recognition, Biometrics, Border Security