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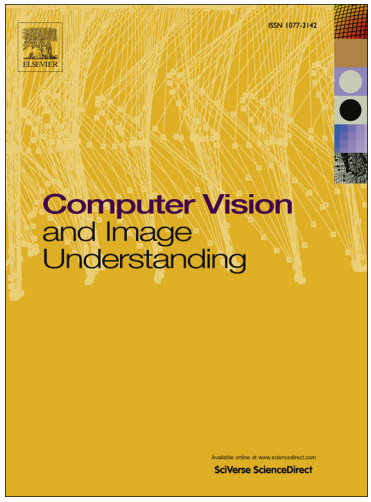

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Javier Galbally, Arun Ross, Marta Gomez-Barrero, Julian Fierrez, Javier Ortega-Garcia

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Iris Image Reconstruction from Binary Templates: An Efficient Probabilistic Approach Based on Genetic Algorithms

Javier Galbally[a], Arun Ross[b], Marta Gomez-Barrero[a], Julian Fierrez[a], Javier Ortega-Garcia[a]

[a]*Biometric Recognition Group - ATVS, EPS, Universidad Autonoma de Madrid. C/ Francisco Tomas y Valiente 11, 28049 Madrid. Spain.*
[b]*Integrated Pattern Recognition and Biometrics Lab (i-PRoBe), Michigan State University. East Lansing, MI 48824. USA.*

Abstract

A binary iriscode is a very compact representation of an iris image. For a long time it was assumed that the iriscode did not contain enough information to allow for the reconstruction of the original iris. The present work proposes a novel probabilistic approach based on genetic algorithms to reconstruct iris images from binary templates and analyzes the similarity between the reconstructed synthetic iris image and the original one. The performance of the reconstruction technique is assessed by empirically estimating the probability of successfully matching the synthesized iris image against its true counterpart using a commercial matcher. The experimental results indicate that the reconstructed images look reasonably realistic. While a human expert may not be easily deceived by them, they can successfully deceive a commercial matcher. Furthermore, since the proposed methodology is able to synthesize multiple iris images from a single iriscode, it has other potential applications including privacy enhancement of iris-based systems.

Keywords: Image reconstruction, Biometric systems, Iris recognition, Binary iriscodes, Security, Privacy

Email addresses: javier.galbally@uam.es (Javier Galbally), arun.ross@mail.wvu.edu (Arun Ross), marta.barrero@uam.es (Marta Gomez-Barrero), julian.fierrez@uam.es (Julian Fierrez), javier.ortega@uam.es (Javier Ortega-Garcia)

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