

2020 International SAUPEC/RobMech/PRASA Conference, Cape Town, South Africa, 29-31 January 2020

Circular interpolation techniques towards accurate segmentation of iris biometric images for infants (conference paper)

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Abstract

In most biometric modalities, recognition and authentication methods for adults have already been fully designed, developed and commercially available. However, for infants and children who are the most vulnerable population to abduction, swapping at hospitals and illegal adoption, such technologies are still lacking. Another challenge is that the current commercial devices are accompanied by locked-in software, which makes devices procurement in bulks unaffordable, especially for local governments in developing countries. Achieving recognition using existing algorithms for images acquired from young children also poses a challenge, since the algorithms have been developed with adults in mind. This paper presents part of a bigger project aimed at developing a multimodal biometric system for infants and children as they grow. With a dedicated focus towards iris recognition, this paper proposes an iris detection method using circular Hough transforms with circular interpolation to achieve successful iris segmentation from a database with the youngest infant being six weeks old. The proposed method outperforms the state-of-the-art iris detection algorithms with segmentation accuracy of 98% for the images within our database.