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A liveness detection system for sclera biometric applications

by Sumanta Das; Ishita De Ghosh; Abir Chattopadhyay

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Abstract: *Liveness detection* systems are essential to test whether a biometric sample is from a live person. However, liveness detection for sclera biometric applications has not yet been investigated much. In a sensor-based approach, subjects are requested to view at specified directions. A gaze detection model *LivGaze* is proposed to verify whether the actual gaze direction matches with the requested one. A mismatch indicates an incorrect user response and hence a probable spoofing attack. In a feature-based approach, deep model *LivDense* is proposed for presentation attack detection. Three types of fake images are used for our work, namely, images scanned from printed papers, smart-phone display screens, and computer display screens. The two phases in a pipeline can be combined to form a system named *LivSclera*, which is efficient and cost-effective. We have achieved an average-case AUC of 0.987, accuracy of 0.99, and in the best-case 100% correct classifications on MASDUM dataset.

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