Iris Cancer Detection System Using Image Processing and Neural Classifier

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Abstract : Iris cancer, so called intraocular melanoma is a cancer that starts in the iris; the colored part of the eye that surrounds the pupil. There is a need for an accurate and cost-effective iris cancer detection system since the available techniques used currently are still not efficient. The combination of the image processing and artificial neural networks has a great efficiency for the diagnosis and detection of the iris cancer. Image processing techniques improve the diagnosis of the cancer by enhancing the quality of the images, so the physicians diagnose properly. However, neural networks can help in making decision; whether the eye is cancerous or not. This paper aims to develop an intelligent system that stimulates a human visual detection of the intraocular melanoma, so called iris cancer. The suggested system combines both image processing techniques and neural networks. The images are first converted to grayscale, filtered, and then segmented using prewitt edge detection algorithm to detect the iris, sclera circles and the cancer. The principal component analysis is used to reduce the image size and for extracting features. Those features are considered then as inputs for a neural network which is capable of deciding if the eye is cancerous or not, throughout its experience adopted by many training iterations of different normal and abnormal eye images during the training phase. Normal images are obtained from a public database available on the internet, "Mile Research", while the abnormal ones are obtained from another database which is the "eyecancer". The experimental results for the proposed system show high accuracy 100% for detecting cancer and making the right decision.
Keywords : iris cancer, intraocular melanoma, cancerous, prewitt edge detection algorithm, sclera