CARDIOVASCULAR INFORMATICS: EXPLAINABLE MODELS FOR PERSONALISED INTEGRATED STROKE ULTRASOUND VIDEO ANALYSIS

Cardiovascular (CV) disease is one of the most common causes of death worldwide and represents a major financial burden for national economies. Effective prediction and prevention of CV disease, particularly which resulted from high-risk asymptomatic atherosclerosis, has now become a top priority. The goal of this lecture will be to give a review of non-invasive ultrasound image processing methods that are used to facilitate the intelligent analysis of carotid plaque morphology for predicting stroke risk. The lecture will begin with a review of clinical methods for visual classification that have led to standardized methods for image acquisition. Methods for ultrasound imaging atherosclerotic plaque denoising, and image segmentation will then be described, followed by an overview of multi-scale texture-feature extraction algorithms and explainable AI methods investigated. Explainable AI risk modeling based on clinical and ultrasonic plaque texture features that enable the assessment of the risk of stroke will be described.

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