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Clinical Diagnosis of Cardiovascular Events using Automated Segmentation and Tracking of Intima Media Thickness (IMT) in Common Carotid Artery (CCA)

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Abstract: Common Carotid Artery (CCA) is the most important blood vessel that emerges from human heart and supplies pure blood to brain, head and facial region. Automatic segmentation of CCA from ultrasound images is an important task in clinical diagnosis. Carotid artery recognition is the primary task in CCA segmentation. It can be performed in fully automated, fast, and reliable way to further facilitate the task of arterial delineation. In this project, a user-independent, real-time algorithm is introduced for carotid artery localization in longitudinal B-mode ultrasound images. The proposed technique acts directly on the raw image, and exploits basic statistics along with anatomical knowledge. The identification and measurement of the Intima Media Thickness (IMT) in CCA has high clinical relevance. With the calculated IMT, patients can be evaluated for various cardiovascular diseases such as arterial plaques, myocardial infarction (heart attack), peripheral vascular disease, kidney artifacts and strokes occurring in brain.