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Intellectual Property Status: Patent Pending

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Software for Rapid Measurement of Carotid Intima-Media Thickness from B-mode Ultrasound Data

AzTE Case # M11-093

Invention Description

Carotid Intima-Media Thickness (CIMT) measurement with B-mode ultrasound is a noninvasive, sensitive, and highly reproducible technique for cardiovascular risk stratification. Studies have shown that CIMT measurement is correlated with cardiac risk factors and can be used as an independent predictor of future myocardial infarction and stroke risk. When using commercially-available software in such measurement, however, interpretation of CIMT ultrasound exams is lengthy. This is because considerable experience needed to achieve accurate and reproducible measurements.

In order to overcome this limitation, researchers at Arizona State University and the Mayo Clinic have developed a novel software system for CIMT determination and measurement employing an active contour model for border detection. A comparison study has shown that this software is more accurate, adaptive, and user-friendly than the commercially-available software.

When compared to commercial software, mean and maximum CIMT readings correlated strongly (average correlation coefficients > 0.85, P < 0.001). In addition, the more adaptive, user-friendly algorithm increases the smoothness of border detection and provides a more flexible user interaction, increasing its usefulness for research and medical diagnosis.

Potential Applications

- Cardiovascular risk stratification using B-mode ultrasound
- Prediction of future myocardial infarction and stroke risk

Benefits and Advantages

- Improved accuracy and reproducibility
- Adaptive, user-friendly algorithm
- Increased smoothness of border detection
- More flexible user interaction