MRI NEURAL NETWORK SEGMENTATION IN ATHEROSCLEROSIS

Jha, Abhinav Kumar, Li, Ran, Woodard, Pamela, Zheng, Jie

Gill, John

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Technology Description

Researchers at Washington University in St. Louis have developed a two-stage neural network model, with CNN and BNN architecture, to segment carotid atherosclerotic plaque components based on multi-weighted MR images and measure the uncertainty of the segmentation output. This model identifies the lipid-rich necrotic core of the carotid atheroma for use in determining the plaque's vulnerability to rupture and cause ischemic stroke.

Stage of Research

Researchers have trained the networks using high-resolution MRI ex vivo data, as well as pathology samples of the same plaque obtained from patients post-surgery.

Publications

- Li R, Zheng J, Zayed MA… Jha AK. (2023). Carotid atherosclerotic plaque segmentation in multi-weighted MRI using a two-stage neural network: advantages of training with high-resolution imaging and histology. Frontiers in Cardiovascular Medicine, 10:1127653.

Applications

- Diagnostic imaging for potential stroke risk

Key Advantages

- Reliable and automated segmentation method

Patents: Pending

Related Web Links: Woodard Profile & Lab