CACTAS-AI: Automatic Segmentation of Calcified Plaque in Carotid Arteries

Jiehyun Kim, Kevin Wang ,Yu Sakai, Youxiang Zhu, Andrew C. Hu, Huy Q. Phi, Nathan Arnett, Grace J. Wang, Brett L. Cucchiara, Jae W. Song, Daniel Haehn

Manual segmentation of calcified plaque, essential for assessing stroke risk, is time-consuming, and conventional methods like 2D and 3D UNet often struggle with the small size. We developed ***CACTAS-AI, a two-step segmentation process***. This approach outperforms baseline methods in plaque segmentation, as shown in the table.

	2D UNet	3D UNet
Best Performance	0.9412	0.8095
Cross-Validation	0.7114	0.6230

1st step: Segment carotid arteries

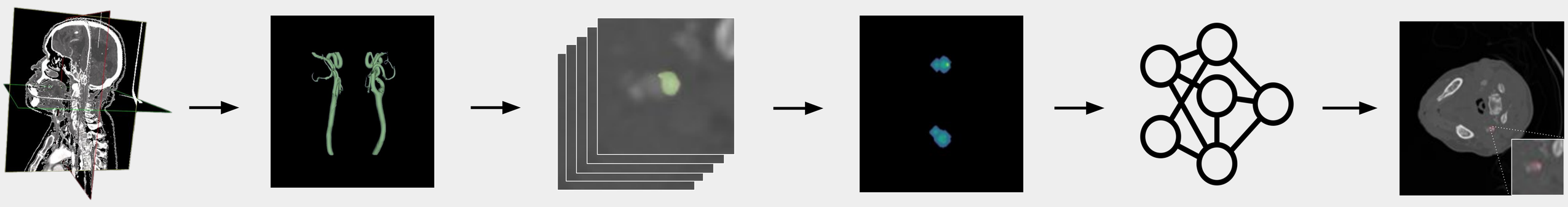
CTA Scans

Result of TotalSegmentator

Applied Threshold Technique

Segmentation with mask improves IoU from 0.3868 to 0.9412

2nd step: Segment calcified plaque in carotid arteries



CTA Scans

Carotid Artery Mask

Extract Slices

Mask Image

Training 2D UNet

Prediction

All free and open source.

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