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## Deep learning for vascular segmentation and tissue characterization in CT images

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Stellingen behorende bij het proefschrift getiteld

**Deep Learning for Vascular Segmentation  
and Tissue Characterization in CT Images**

1. Image processing techniques used for atherosclerotic plaque detection should be capable of describing both the composition and location of plaques. - Chapter 2.
2. Introducing an explicit vascular graph can help the model better capture irregular and long-range vessel connectivity. - Chapter 3.
3. A top-k MIP (Maximum Intensity Projection) preserves the k highest intensity values along any given direction, thereby encoding the fine-grained 3D structure of the vessel tree. - Chapter 4.
4. The liver vessel prior used for Couinaud segmentation can be replaced with learnable implicit contextual information. - Chapter 5.
5. Hounsfield unit (HU) based differentiation of plaque components is unreliable due to the significant overlap of mean HU values of lipid-rich and fibrous plaques.  
- *The International Journal of Cardiovascular Imaging*. 2016 Jan; 32(1): 161-72.
6. An accurate delineation of the vessels is a crucial step to define an accurate segmentation of the liver segments. - *Journal of Digital Imaging*. 2020 Apr;33(2):304-23.
7. Maintaining the connectivity and topological structure of the segmented blood vessels is a clinical and human experience requirement, which should be considered in the design of the blood vessel segmentation algorithm. - *IEEE Journal of Biomedical and Health Informatics*. 2021 Oct 6; 26(3): 1251-62.
8. In dense prediction tasks, capturing relations between all pairs of pixels is usually unnecessary due to the redundant information contained within the image. - *IEEE Transactions on Pattern Analysis and Machine Intelligence*. 2023 May; 45(5): 5712-5730.
9. A fancy model is for research; a simple model is for real-world use.
10. Open-source data and code play a positive role in advancing technology.