

Machine learning algorithms for coronary artery segmentation

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Coronary artery disease (CAD) is one of the leading causes of death worldwide [1, 2]. CADs are caused primarily by vessel narrowing (stenosis). The visual detection of stenosis, which is a tedious, subjective and time-consuming process, relies on the evaluation of CT images by specialists. Another complementary method consists on the reconstruction of the vessels from the image, thus obtaining the coronary tree geometry. This model, if it is precise enough, is particularly compelling, as it can be used to non-invasively calculate clinical parameters such as the Fractional Flow Reserve (FFR) [1].

The segmentation of images requires a classification of each pixel of the image. Again, performing this task manually is time-consuming and prone to mistakes. Therefore, the need for automatic segmentation techniques that have the precision necessary for clinical evaluation has increased in the last few years. Among the most used techniques we find methods based on neural networks, in particular convolutional neural networks (CNNs) [2, 3, 4, 5].

Different parameters will be presented to measure the goodness of the methods used.

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