Coronary artery segmentation

## Introduction:

There are two options in this project for segmentation coronary artery from DSA image. One is using Frangi filter, another is based on Canny filter.

**Prerequisite:**

Visual studio 2022

OpenCV v4.7: create dependencies folder under project root directory, then copy OpenCV include and x64 folder (from OpenCV build folder).

## Results:

A black and red image

Description automatically generated

Figure 1, Frangi result.

A collage of images of an angiogram

Description automatically generated

Figure 2, Canny results: 1st row, from left to right is Canny boundary, inversed coronary image, adaptive thereshold mask; 2nd row, from left to right is colored vessel, centerline, overlay centerline on the original coronary image

Reference:

Frangi: C++/OpenCV implementation of the Frangi multiscale vesselness filter in 2D (reference: A. F. Frangi, W. J. Niessen, K. L. Vincken, and M. A. Viergever, “Multiscale vessel enhancement filtering,” in Proc. Med. Image. Comput. Assist. Interv. 1496, pp. 130–137 (1998)).

This code is based on <https://github.com/ntnu-bioopt/libfrangi.git>