Problem statement (Updated: 17 Jan 2022)

In this problem statement, we will be using an in-house x-ray angiogram. This small dataset contains annotated keyframes and non-keyframes, where keyframes denotate that the frame is ideal for future analysis. Within each "*.npz*" file, you will find the corresponding patient's x-ray angiogram as an array of 2D greyscale images with pixel dimension of 128x128. The corresponding annotations are provided in the csv folder. Following are sample images from the dataset:

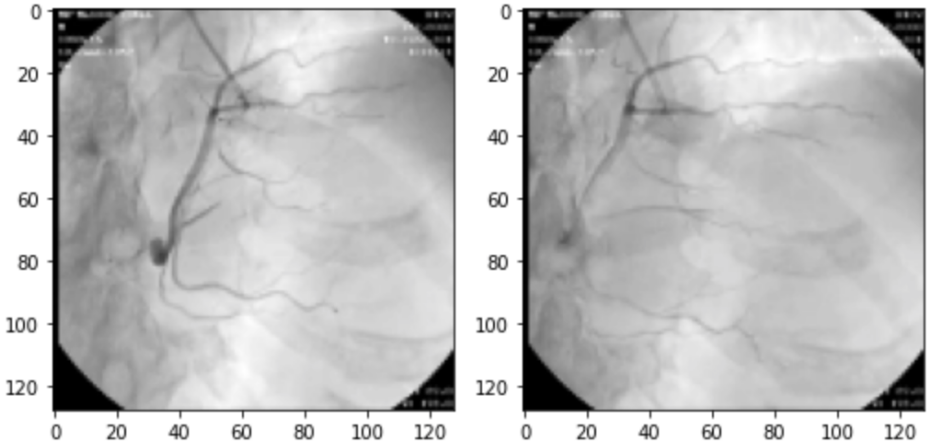

Figure 1 Sample images of keyframe (left) and non-keyframe (right)

The tasks for the assignment are as follows:

1. Visualize the images and annotations. Show some sample images and annotations.
2. Implement and compare two deep learning models for the detection and classification of keyframes using PyTorch package[2].
3. You may use existing deep learning models, however, modifications to the model architectures must be carried out.
4. Arrange the dataset for experiments to train and test the deep learning models.
5. Please kindly provide explanations for any decisions made either directly within the code or in the submitted code documentation
6. Submitted code documentation should include relevant metrics to evaluate the model performance, etc.

You will be evaluated according to the following:

1. Coding skills
    a. All code has to be written by you
    b. Should python libraries be required, it should be clearly stated
    c. Code organization
2. Critical and creative thinking
3. Presentation of data and results

<u>Please upload your code and documentation to Github and forward us the link</u>
<u>Kindly refer to the assessment email for the deadline</u>