

# Computer Assisted Interventions – Final Project

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The final project should be completed in Python 3.

You are allowed to complete this project in groups of 1-5 students. Marking will not be impacted by the size of the group; every student within a group will receive the same grade.

Please make sure to add all your group's first and last names onto the pdf filename. The TA cannot guess who is part of the group otherwise, and in turn, you may receive a zero.

Please submit your files on moodle by April 24<sup>th</sup>, 11:59 pm

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The project consists in tracking the displacement of a region of interest on 2D 'cine' MR images. The displacement will be expressed relative to a 'reference' position defined on the 2D reference image.

You are provided:

- The 'cine' images
- The reference image
- The mask of the region of interest. The segmentation was performed on the reference image

You are expected to:

- (70 points) Write a python script such that when the script is run:
  - o The region of interest is tracked on each 'cine' image
  - o A video (.avi or .mp4) is generated. The video should display the segmentation of the region of interest on each cine image, as shown during Lecture 8
- (30 points) Write a 1 page paper (pdf file) with the following sections: introduction, methods, results, discussion

Notes and hints:

- You are allowed to use any method as you see fit
- You are allowed to re-use any existing code you find useful
- When using a package, please write in a comment how to install it (i.e. pip install numpy)
- I recommend using a simple rigid image registration
- You do not want to register the complete images, only the region of interest defined by the mask
- The 'cine' images are usually referred to as the 'moving' images
- The reference image is usually referred to as the 'fixed' image
- Code should be well documented. A working script with no comments will receive only partial credit. Documentation entails writing a description of each function/method, as well as comments throughout the code to explain the program flow.

Please submit both your python script and the paper on moodle.