# CS 736 - Algorithms for Medical Image Processing
# Assignment Submission Instructions

## General Instructions:

- For any questions or clarifications regarding the assignments, please post your queries on Moodle first. If you do not get any response, meet or email the instructor directly at the earliest. Do not wait till the final submission day.

- Late submission policy: There is a 25% penalty per day; thus, zero credit is earned if submitted after 3 days past the due date. Start early, most assignments will take longer than you expect (Hofstadter's Law).

- Group submission policy: You can do the assignments alone or in a group of at most 3 students. Groups once formed cannot be changed. If you do any of the assignments in a group, there will be an additional viva at the end of the semester covering the entire course material.
  **Note: Only ONE** student from each group should make a complete submission on Moodle.

- Plagiarism policy: Please ensure that you do not give/take your code to/from members of other groups for your assignments. We will adopt a zero-tolerance policy against any forms of plagiarism or any other form of cheating. Givers and takers will both be considered equally culpable.

## Assignment Submission Guidelines

For every assignment, a zip file named assignmentX_description.zip is provided. `unzip'ing this file will give you the directory template for your submission. For each question it will contain a directory labeled by the question number, and each of these directories will in turn contain the following dirs:

### data/:

This dir contains all the input images and other data that your assignment will need.

### code/:

This is where all your code goes. There must be one main script, named myMainScript.m, which must generate all images/plots/numbers required for the question on clicking `Run' *without any intervention*. It is strongly recommended to use matlab editor's `cell mode' (%% ) feature, which makes writing and debugging scripts easier.

- If a particular section of your code takes more than 5 minutes to finish, document this in myMainScript.m. Use the `tic', `toc' commands to time your code and the `waitbar' function to show current status.

- When loading images or other data, use relative paths, e.g.:

```
im = imread('../data/file.mat');
```

### report/:

This dir should contain your report for the corresponding question, describing your findings and comments along with supporting images/graphs. Consider using matlab's `publish' feature to automatically generate your report from your myMainScript.m. If using this facility, generate a html document (this is usually the best formatted and can also be edited if needed). Otherwise, submit a **PDF** file (**preferred**) created using your favorite document generation tool.

### results/:

In **ALL** cases, you should store your output results (images, graphs, etc.) as a mat file in this dir and reference it from your report. See the `save' function on how to do this. mat files are a lossless format and in addition can store negative and real numbers, unlike most image formats such as jpg, png etc.

Once you have completed all the questions and are ready to make a submission, do the following:

- prepend the roll numbers of all members in your group to the top assignment directory name, so the new dir name is something like:
  `153050001_130110003_143076001_assignmentX_description/`

- zip the above directory, say using the command:
  `$ zip -r 153050001_130110003_143076001_assignmentX_description.zip 153050001_130110003_143076001_assignmentX_description`

- If the zipped file is less than 50MB (maximum attachment size on moodle) you can submit it via http://moodle.iitb.ac.in at the provided assignment submission page.

- If the zipped file is greater than 50MB, you will need to create a split zip archive containing several chunks of size not greater than 50MB each and upload all of them as attachments.
  In unix you can do this using:
  `$ zip -s 50m -r file.zip directory/`
  make sure to upload all the chunks that are created, file.zip, file.z01, file.z02 etc. Instead of `file' you should provide the full name as explained above containing the roll numbers.

  In windows you can use 7zip (ftp://ftp.iitb.ac.in/IITB/windows/7-zip/).

## Some matlab tips

- For Matlab tips and tricks, including tips to write fast-running code, https://www.cse.iitb.ac.in/~suyash/teaching/algorithms_for_medical_image_processing.html

- If imshow(im); shows a blank image, consider using imshow(mat2gray(im)); or enable a colormap as described below.

- Use `daspect()' or `**axis equal'** to set the pixel dimensions or, equivalently, the aspect ratio.

- Use `**impixelinfo'** to interactively probe intensities in a displayed image, e.g., while debugging.

- Sometimes image processing results are best visualized with a colormap. This is done using the `**colormap'** function. The default `colormap' in Matlab uses 64 colors, which may create artifacts. To avoid this, use at least 200 colors. This can be done by the following lines of code:

```
myNumOfColors = 200;
myColorScale = [ [0:1/(myNumOfColors-1):1]' , …
[0:1/(myNumOfColors-1):1]'    , [0:1/(myNumOfColors-1):1]' ];
imagesc (single (phantom)); % phantom is a popular test image
colormap (myColorScale);
colormap jet;
daspect ([1 1 1]);
axis tight;
colorbar
```