

COE 485.022 Image Processing III

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What every student must be able to do:

- 1) Learn MATLAB such that the following tasks can be done:
 - Basic to intermediate skills in using it
 - Write m-files: functions and commands
 - Use built-in image processing functions to learn basic image processing techniques to help design an image-processing tool.
- 2) Design and implement an image-processing tool capable of doing the following:
 - Load an image in at least two image file formats (e.g., TIFF, JPEG, BMP, etc.)
 - Do the following processing on a loaded image:
 - Color separation: Show the Red-Green-Blue color channels in the image
 - For a given point of the image (on-screen), show
 - The Red, Green, and Blue values
 - The (x, y) coordinates of the point (using pixels as the unit)
 - The True-color value of the point
 - The color of the point (in true-color)
 - Convert the true-color image to gray-scale using:
 - Linear conversion
 - Non-linear conversion
 - Calculate and display the histograms for the true-color and the three color channels (R,G,B)
- 3) The completed image-processing tool (possibly implemented in VB) must:
 - Have a user-friendly interface
 - Using a selected algorithm/operator (e.g., Sobel):
 - Perform horizontal edge-detection
 - Perform vertical edge-detection
 - Perform horizontal & vertical edge-detection
 - Perform at least three image-enhancement filters: (Median, Max., Min., etc.)
 - On-line user-guide
- 4) Write a report with summary of theoretical work, as well as:
 - Results, with comments & analysis
 - Problems faced, and solutions applied
 - Extensions applied, if any, with observations (bonus)
 - Experience gained
 - Suggestions for future work (extending the project)

Where students/groups must be different:

- 1) 1) The selection of the algorithm(s) → Group-level
- 2) 2) The selection of image modality (application area) → student-level: at least two modalities per student, with one possibly shared in a group of two
- 3) 3) The design and implementation of the tool

Rules:

- • Students wishing to take this project must meet the instructor (Dr. Atef Jawad Al-Najjar) as soon as possible. → Pre-requisite: consent of the instructor & Senior Standing.
- • Students are required to start this semester, such that by the end of the third week of next semester [022], they will be way ahead in their project. (Some students have already done so.)
- • No IC grade will be entertained, except in extra-ordinary situations. All IC grades (if any) must be resolved before the end of the next summer session [023].
- • Each student (or group) is encouraged to develop an on-line power-point show for placement on the Web. (Bonus.)
- • Students are encouraged to modify standard algorithms in their implementations, with proper comments and analysis (Bonus)
- • The Dean (CCSE) will be invited to attend the final presentations.