

ECE418

Introduction to Image and Video Processing

Optional Project

If you elect to do an optional project, and your score for that project is higher than the score for your final exam, then your project and your final exam will each carry a weight of 15% and 20%, respectively. In the alternative (if your project scores lower than your final), your final exam will count for 35%. So you can't lose by doing a project!

You may work individually or in teams. Below is a sample list of possible project topics. Other possible cool topics are in the areas of image/video segmentation, classification, recognition, analytics, mobile communications, computer graphics, etc. You may choose your own project topic, subject to the instructor's approval.

General Image/Video Processing

- design and evaluate 256-color palette.
- design and evaluate image halftoning algorithm.
- design and implement algorithm for conversion between NTSC and PAL formats, interlaced to progressive, etc.
- watermarking: hide hard-to-destroy information (e.g., your signature or other personalized mark) in image or video file.
- create special effects such as morphing in video.

Image/Video Restoration.

- restore blurred license plate picture and identify license plate number.
- inpainting: remove scratches and blobs from old pictures.
- remove scanner interference patterns in infrared CCD imaging (appear as diagonally moving lines in image sequences).
- video superresolution: construct a high-resolution pic from a low-resolution image sequence.

Image/Video Compression

- compare performance of baseline, progressive and hierarchical JPEG, and JPEG2000 coders, using software from various Web sites.
- find a suitable approximation to rate–distortion curve for JPEG and wavelet coders.
- remove blocking artifacts in JPEG images.
- demonstrate progressive transmission application for JPEG, wavelet, or pyramid coder.