Course: EE565 – Advanced Image Processing

Semester: Fall 2013

Credit hours: 3 hr Lecture

Prerequisites: EE465 Introduction to Digital Image Processing

Instructor: Dr. Xin Li, 939 Engineering Sciences Building 293-9125, xin.li@mail.wvu.edu

Schedule: MWF 13:00-13:50

Location: Room 205 Mineral Research Building

Office Hours: MWF 11:00-12:00 or by appointment

Course Objectives: The main objectives of this course include: 1) to grasp the theory of mathematically modeling image signals; 2) to learn how to develop various algorithms for analysis and processing of image signals; 3) to explore new applications of image processing into computer vision, graphics and biomedical imaging; 4) to collect hand-on experience on MATLAB-based image processing. This course will also train graduate students on research and development skills specifically on literature review, technical writing and oral presentation.

Expected Learning Outcomes:
Upon successful completion of this course:

1. Students will grasp the important techniques of lossy image compression including arithmetic coding, Rate-Distortion optimization and wavelet transforms.
2. Students will learn the most recent advances in wavelet-based image compression.
3. Students will have gained an understanding of how statistical techniques can be employed to model and process digital images.
4. Students will have gained the ability to implement wavelet-based image processing algorithms.
5. Students will be able to analyze the popular image restoration algorithms using statistical modeling techniques.

Texts:
No textbook is required. Instructor will provide PPT files, additional reading material and lecture notes of his own at both WVU eCampus. You can also check your grading results at eCampus.
Grading: 10 Assignments (@ 5 % each)  50 
Midterm project  25 
Final project  25 

Grade Assignment: 100 – 90 A  
   89 – 80 B  
   79 – 70 C  
   69 – 60 D  
   59 – 0 F

Grading Policy: No make-up exams except by prior arrangement with instructor

Computer Assignments:  
Computer assignments will be given on a weekly basis (Typically they are due on Mondays). All computer assignments are designed to collect hand-on experience of image processing under MATLAB (that is why EE465 is the prerequisite).

Course Projects:  
There will be two projects: individual-based midterm and team-based final. For the midterm project, you will be asked to implement a recently published paper to reproduce the reported experimental results. For the final project, you can find a partner to work on an image-processing related research & development problems. You and your partner will be required to do an oral presentation about the final project in addition to the submission of your source codes.

Academic Honesty:  
Students are expected to exhibit the same level of professionalism and integrity that will distinguish them in their future careers. Discussion of assignments with your instructor or other students is encouraged, but the work you turn in should be your own. Cases of academic dishonesty will be handled pursuant to WVU policies.

Social Justice Statement:  
“West Virginia is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and nondiscrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class. Please advise me and make appropriate arrangement with Disability Services (293-6700).”