

Digital Image Processing

M,W,F 1:30 - 2:20pm
Holmes 248

Human visual perception, image formation, sampling and quantization, enhancement and restoration, color image processing, wavelets and multiresolution representations, image and video compression.

In this course, we will examine some of the fundamental aspects of digital image processing. Recent technological advances make computing and display platforms suitable for image processing widely available, and of practical use in a broad range of applications. Examples include digital photography, wireless videotelephony, network-based multimedia communications, and high-definition television.

Prerequisites: A background in discrete systems (EE 415 or equivalent). Programming experience may be useful, but is not required.

Lecturer:

T.R. Reed
Office: Holmes 439
Office hours: M,W,F 2:30 - 3:20pm (or by appointment)
Phone: 956-5309
E-mail: trreed@hawaii.edu

Text:

R.C. Gonzalez and R.E. Woods, *Digital Image Processing (third edition)*
Prentice Hall, 2008

Grading (see notes below):

Midterm project presentation (oral) 10%
Midterm project report 25%
Final project presentation (oral) 25%
Term project report 40%

Term project: The term project will be on a topic of your choice, subject to the approval of a one page written proposal, submitted no later than the end of the third week of class. The project may consist of a term paper and/or include experimental work, as you choose. Suggestions for possible topics will be available. Midterm progress reports and final project presentations will be presented in class. Midterm reports will be presented the 8th week of class and final presentations will be the last week of the semester (approximately, depending on enrollment). Both will be 15 minutes in length with an additional 5 minutes for questions. The written midterm report will be due the 8th week of class. The term paper/project report will be due at the end of the term.

Course Outline and Corresponding Material in the Text

Introduction: Overview of the field and its applications	Ch. 1
Digital image fundamentals	Ch. 2
Image enhancement in the spatial domain	Ch. 3
Image enhancement in the frequency domain	Ch. 4
Image restoration	Ch. 5
Color image processing	Ch. 6
Wavelets and multiresolution processing	Ch. 7
Image compression	Ch. 8