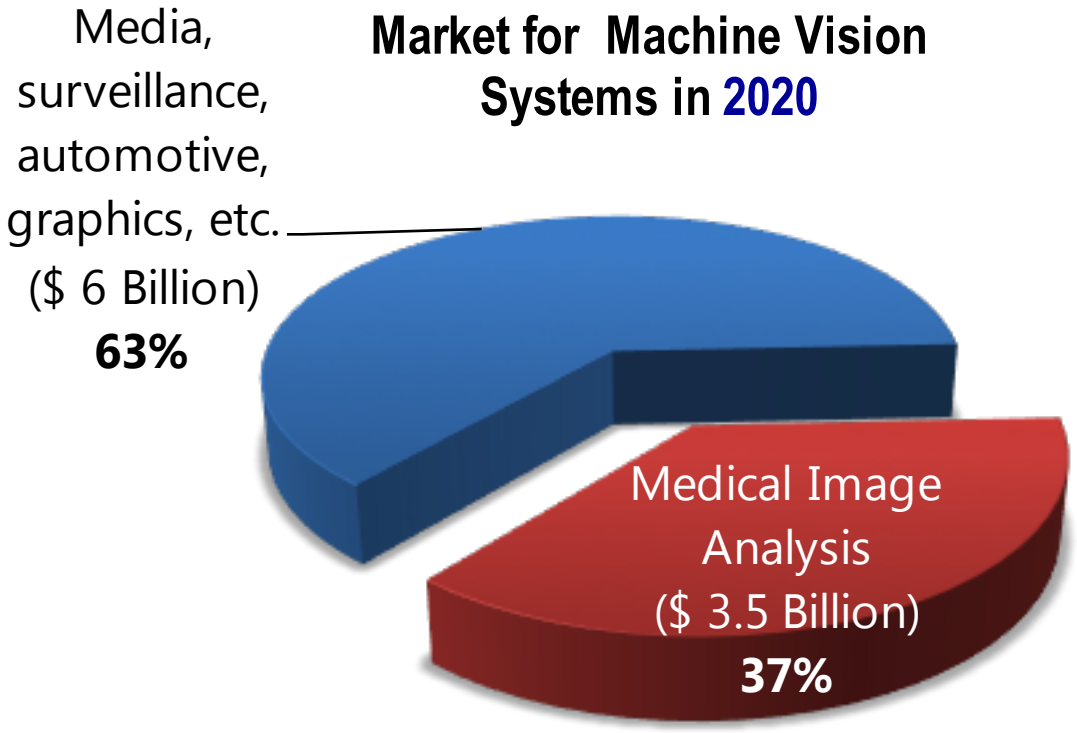
Digital Image Processing
EE60062 / Aut2016

What to expect?

How to excel?

Why this subject?



Digital Image Processing (DIP)

- Type: PG Level Elective
- Subject Code: EE60062
- LTP: 3-1-0
- Location: N232, EE
- Time: Slot A
  - Mon (08 AM – 10 AM)
  - Tue (12 PM – 1 PM)
  - Tue (6 PM – 7 PM)
- Format: Outcome based Education

Debdoot Sheet, PhD
Instructor

TAs and Tutors - *Your go-to guys for clearing doubts*

Rachana Sathish

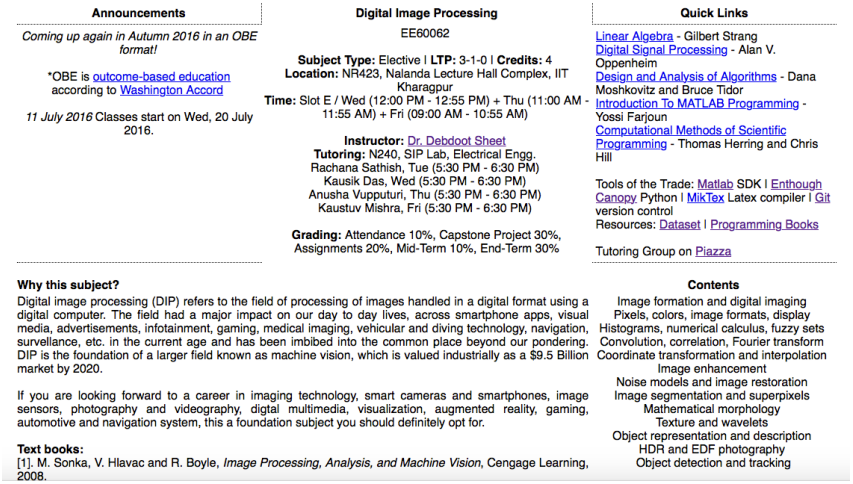
Kausik Das

Anusha Vupputuri

Kaustuv Mishra

Daily Resources

Syllabus Details



Announcements

Coming up again in Autumn 2016 in an OBE format!

*OBE is outcome-based education according to Washington Accord

11 July 2016 Classes start on Wed, 20 July 2016.

Digital Image Processing

EE60062

Subject Type: Elective I **LTP:** 3-1-0 I **Credits:** 4
Location: NR423, Nalanda Lecture Hall Complex, IIT Kharagpur
Time: Slot E / Wed (12:00 PM - 12:55 PM) + Thu (11:00 AM - 11:55 AM) + Fri (09:00 AM - 10:55 AM)

Instructor: Dr. Debdoot Sheet
Tutoring: N240, SIP Lab, Electrical Engg.
Rachana Sathish, Tue (5:30 PM - 6:30 PM)
Kausik Das, Wed (5:30 PM - 6:30 PM)
Anusha Vupputuri, Thu (5:30 PM - 6:30 PM)
Kaustuv Mishra, Fri (5:30 PM - 6:30 PM)

Grading: Attendance 10%, Capstone Project 30%, Assignments 20%, Mid-Term 10%, End-Term 30%

Quick Links

Linear Algebra - Gilbert Strang
Digital Signal Processing - Alan V. Oppenheim
Design and Analysis of Algorithms - Dana Moshkovitz and Bruce Tidor
Introduction To MATLAB Programming - Yossi Farjoun
Computational Methods of Scientific Programming - Thomas Herring and Chris Hill

Tools of the Trade: Matlab SDK I Enthough Canopy Python I MikTex Latex compiler I Git version control
Resources: Dataset I Programming Books

Tutoring Group on Piazza

Why this subject?

Digital image processing (DIP) refers to the field of processing of images handled in a digital format using a digital computer. The field had a major impact on our day to day lives, across smartphone apps, visual media, advertisements, infotainment, gaming, medical imaging, vehicular and diving technology, navigation, surveillance, etc. in the current age and has been imbibed into the common place beyond our pondering. DIP is the foundation of a larger field known as machine vision, which is valued industrially as a $9.5 Billion market by 2020.

If you are looking forward to a career in imaging technology, smart cameras and smartphones, image sensors, photography and videography, digtal multimedia, visualization, augmented reality, gaming, automotive and navigation system, this a foundation subject you should definitely opt for.

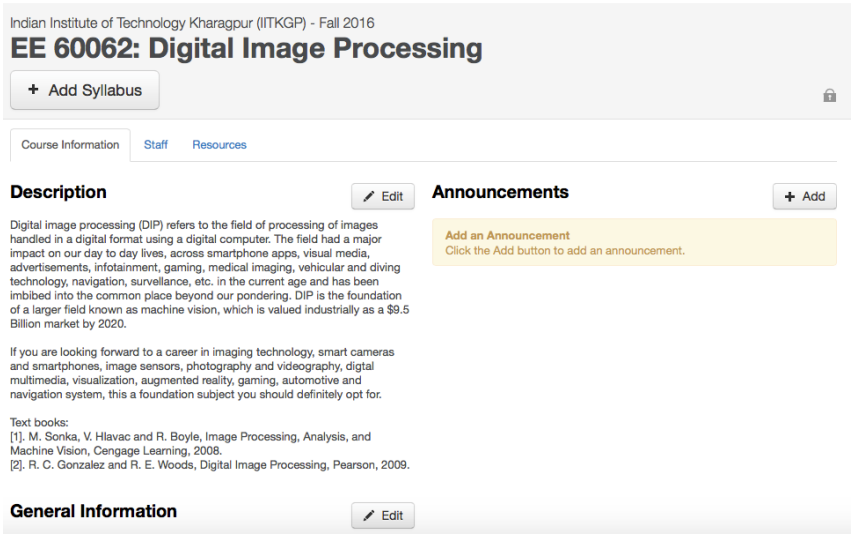
Text books:

[1]. M. Sonka, V. Hlavac and R. Boyle, *Image Processing, Analysis, and Machine Vision*, Cengage Learning, 2008.

Contents

Image formation and digital imaging
Pixels, colors, image formats, display
Histograms, numerical calculus, fuzzy sets
Convolution, correlation, Fourier transform
Coordinate transformation and interpolation
Image enhancement
Noise models and image restoration
Image segmentation and superpixels
Mathematical morphology
Texture and wavelets
Object representation and description
HDR and EDF photography
Object detection and tracking

Assignments and Forum



Indian Institute of Technology Kharagpur (IITKGP) - Fall 2016

EE 60062: Digital Image Processing

+ Add Syllabus

Course Information | Staff | Resources

Description Edit

Digital image processing (DIP) refers to the field of processing of images handled in a digital format using a digital computer. The field had a major impact on our day to day lives, across smartphone apps, visual media, advertisements, infotainment, gaming, medical imaging, vehicular and diving technology, navigation, surveillance, etc. in the current age and has been imbibed into the common place beyond our pondering. DIP is the foundation of a larger field known as machine vision, which is valued industrially as a $9.5 Billion market by 2020.

If you are looking forward to a career in imaging technology, smart cameras and smartphones, image sensors, photography and videography, digtal multimedia, visualization, augmented reality, gaming, automotive and navigation system, this a foundation subject you should definitely opt for.

Text books:
[1]. M. Sonka, V. Hlavac and R. Boyle, Image Processing, Analysis, and Machine Vision, Cengage Learning, 2008.
[2]. R. C. Gonzalez and R. E. Woods, Digital Image Processing, Pearson, 2009.

General Information Edit

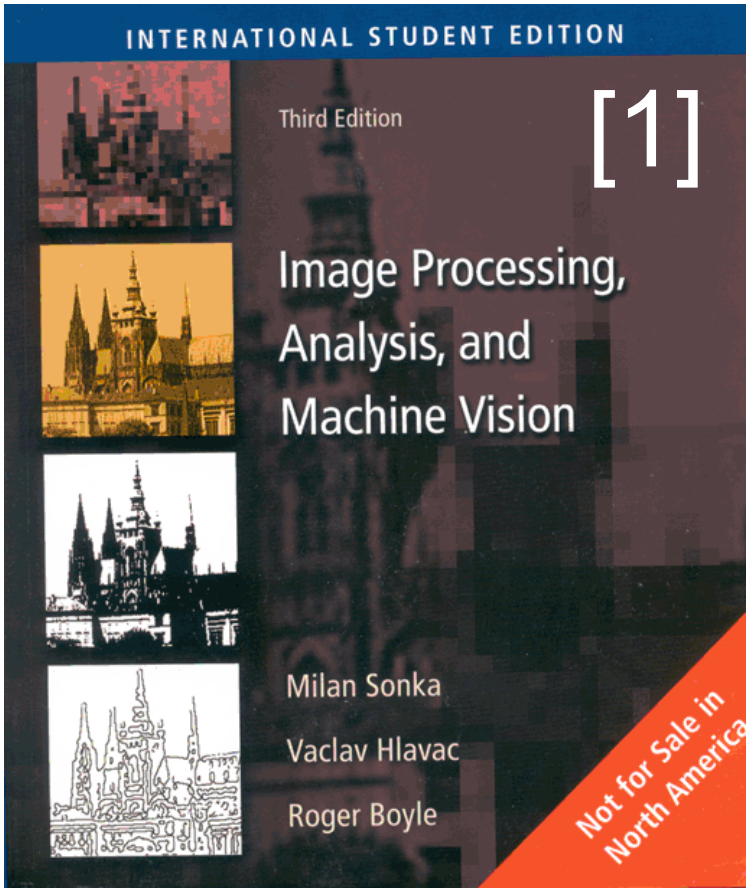
Announcements + Add

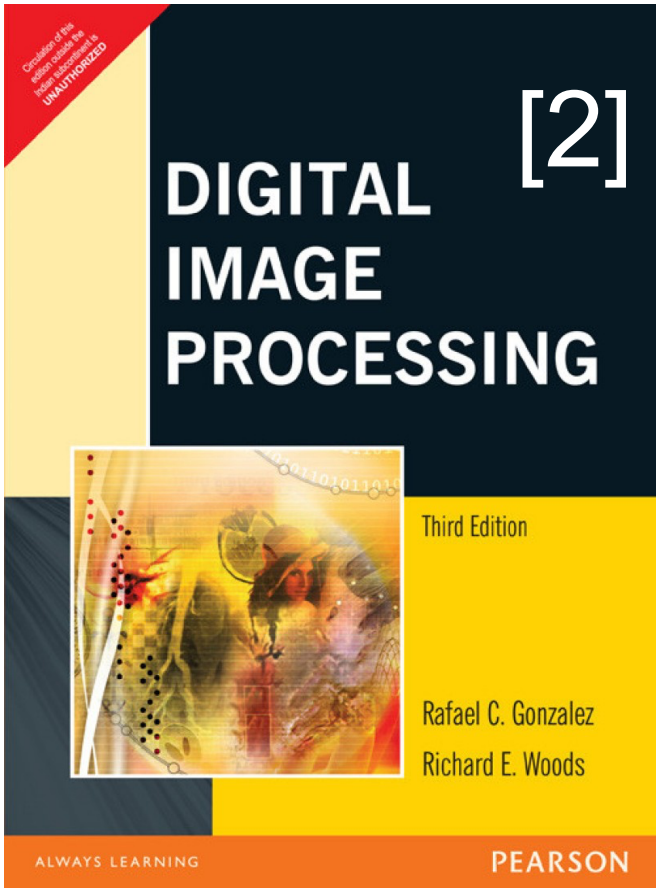
Add an Announcement
Click the Add button to add an announcement.

www.facweb.iitkgp.ernet.in/~debdoot/courses/EE60062/Aut2016

https://piazza.com/iitkgp.ernet.in/fall2016/ee60062/home

Text Books

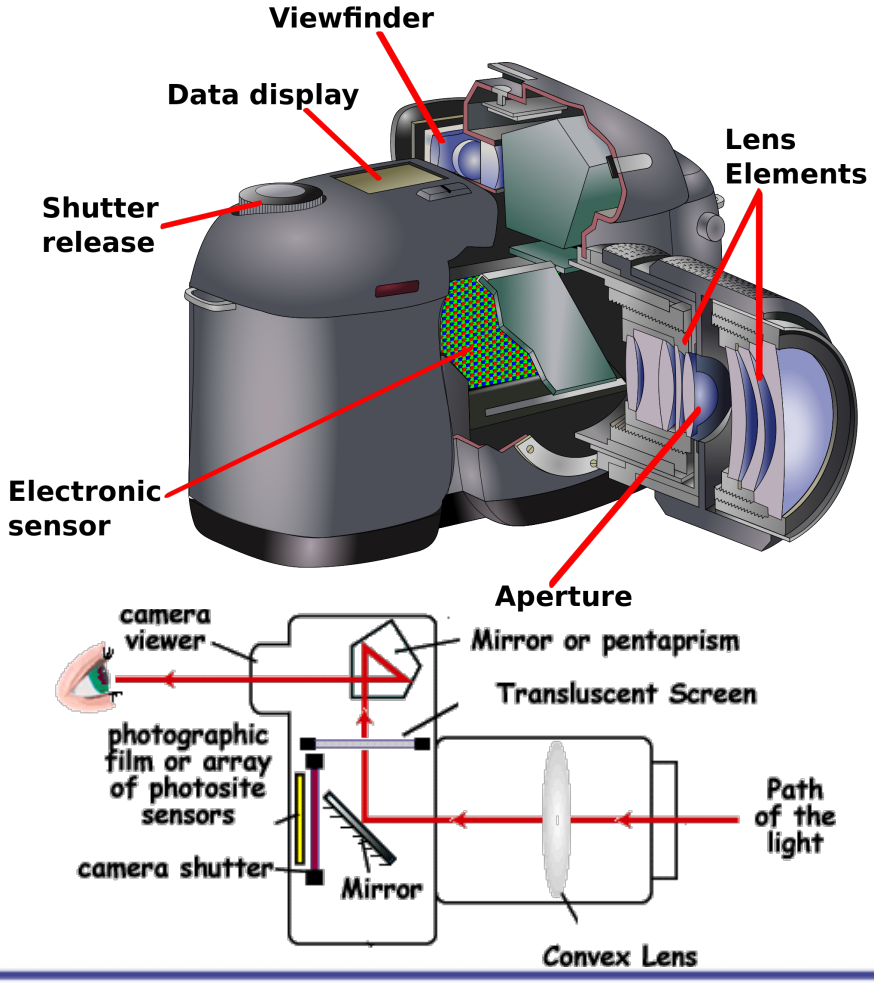

INTERNATIONAL STUDENT EDITION
Third Edition
[1]
Image Processing, Analysis, and Machine Vision
Milan Sonka
Vaclav Hlavac
Roger Boyle
Not for Sale in North America

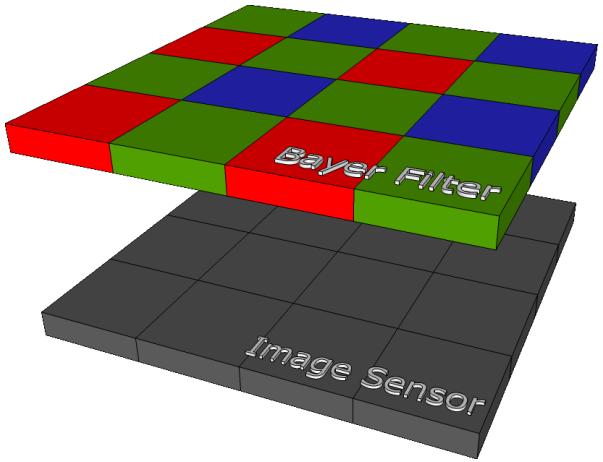

[2]
DIGITAL IMAGE PROCESSING
Third Edition
Rafael C. Gonzalez
Richard E. Woods
ALWAYS LEARNING
PEARSON

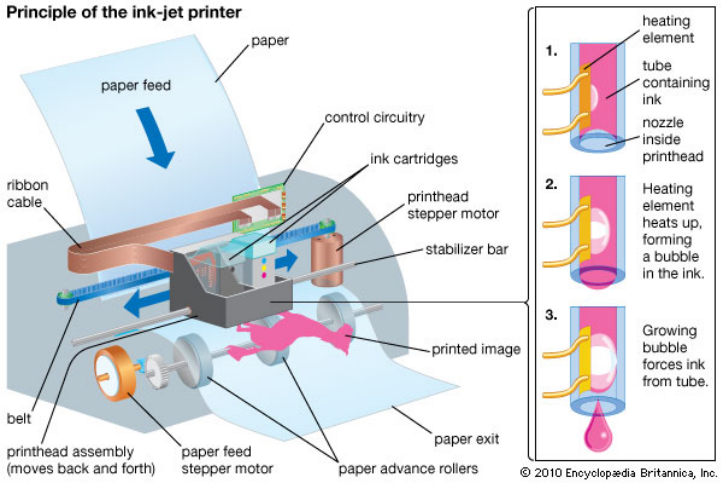
Syllabus Overview

- Image formation and digital imaging
- Pixels, colors, image formats, display
- Histograms, numerical calculus, fuzzy sets
- Convolution, correlation, Fourier transform
- Coordinate transformation and interpolation
- Image enhancement
- Noise models and image restoration
- Image segmentation and superpixels
- Mathematical morphology
- Texture and wavelets
- Object representation and description
- HDR and EDF photography
- Object detection and tracking

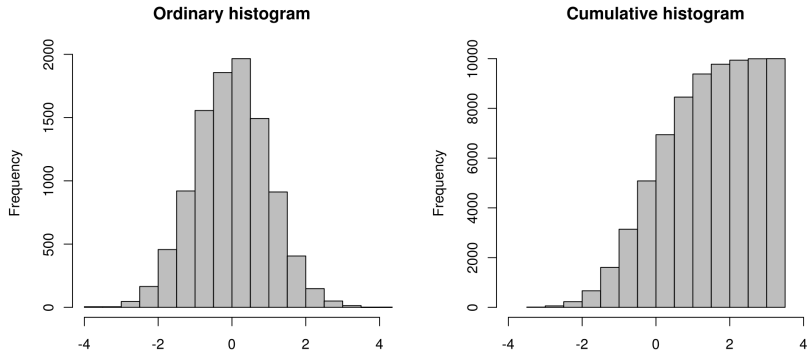
Module I: Introductory Concepts

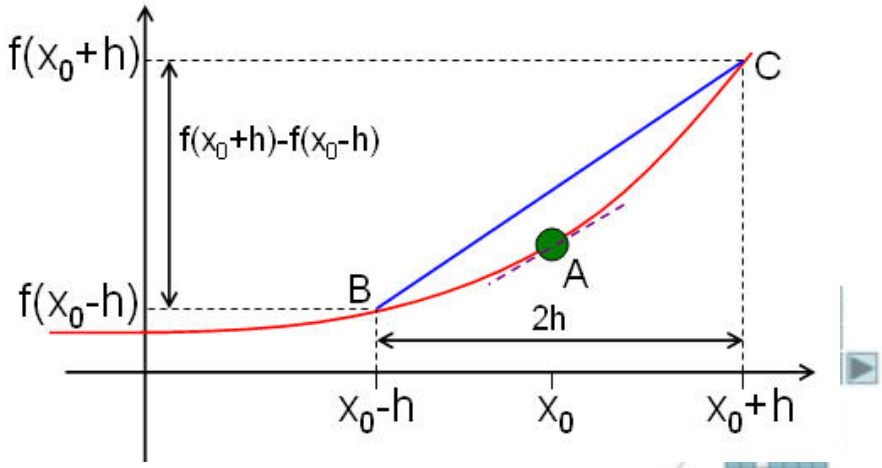


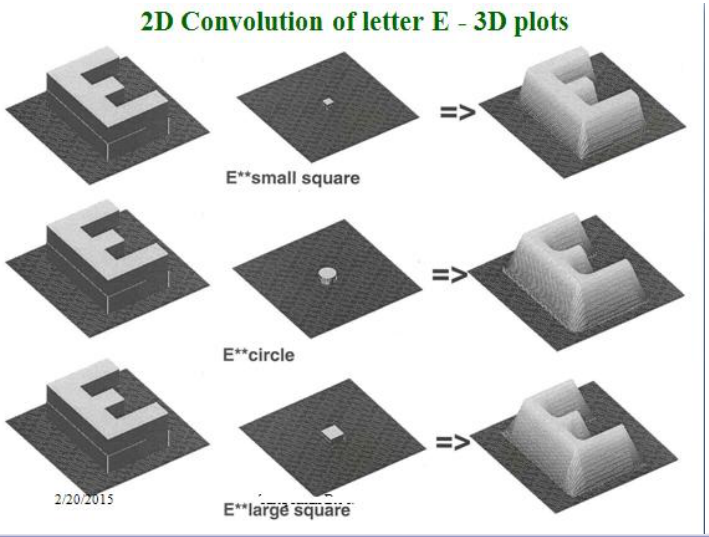


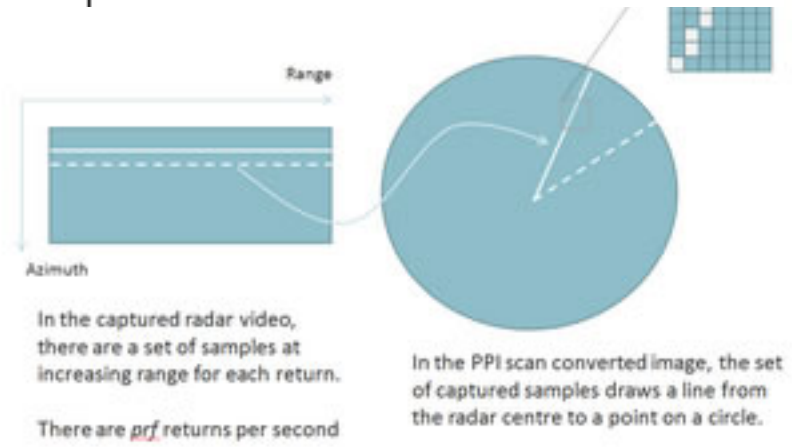


Module II: Analytical Foundation for Digital Image Processing

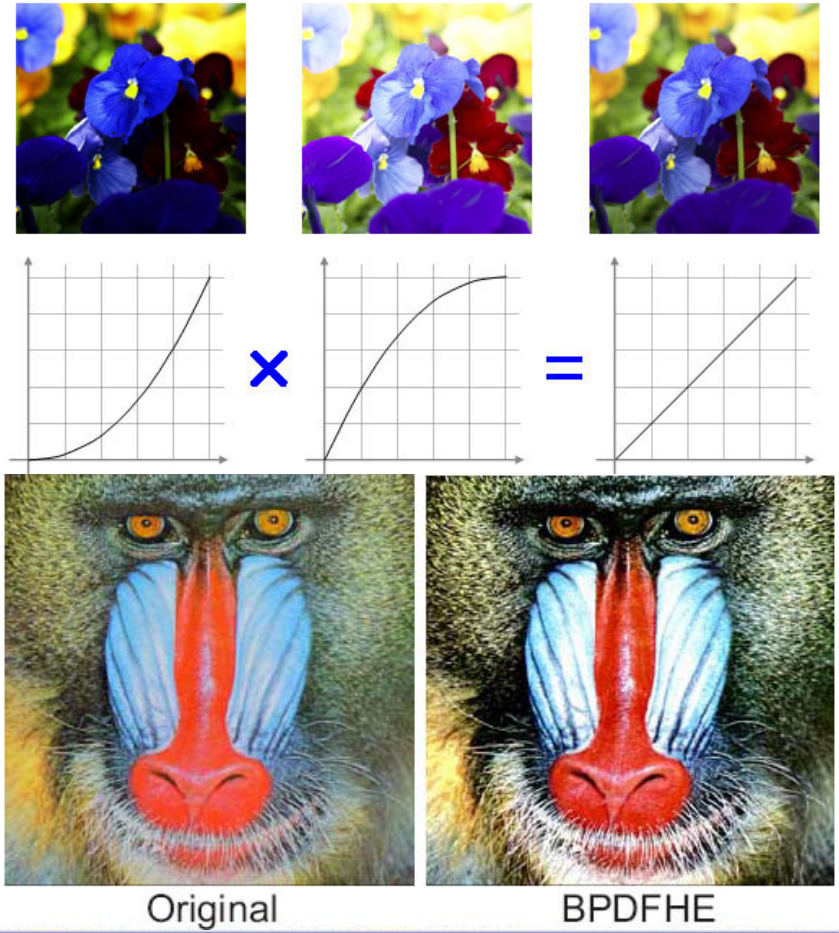


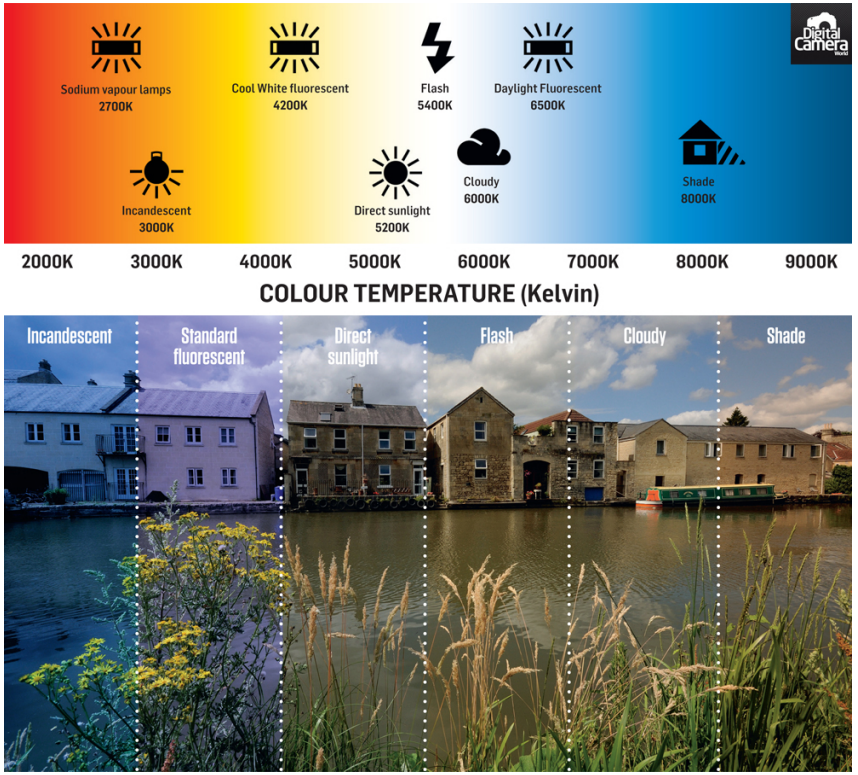




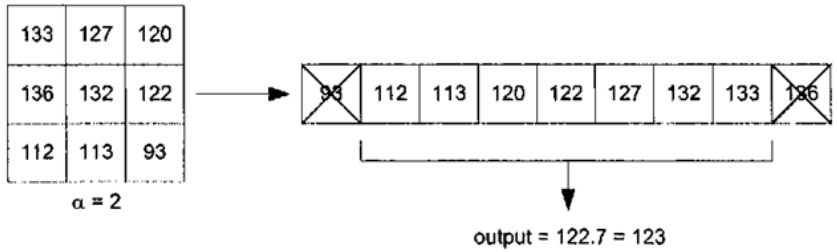


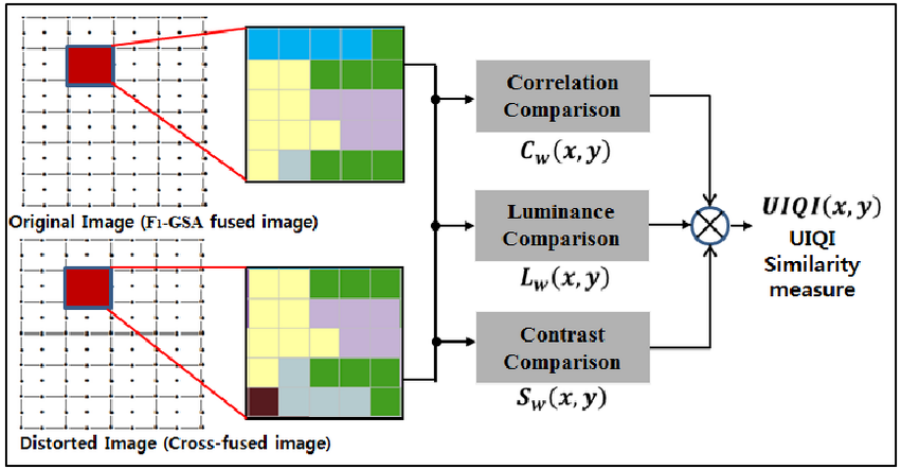
Module III: Image Enhancement



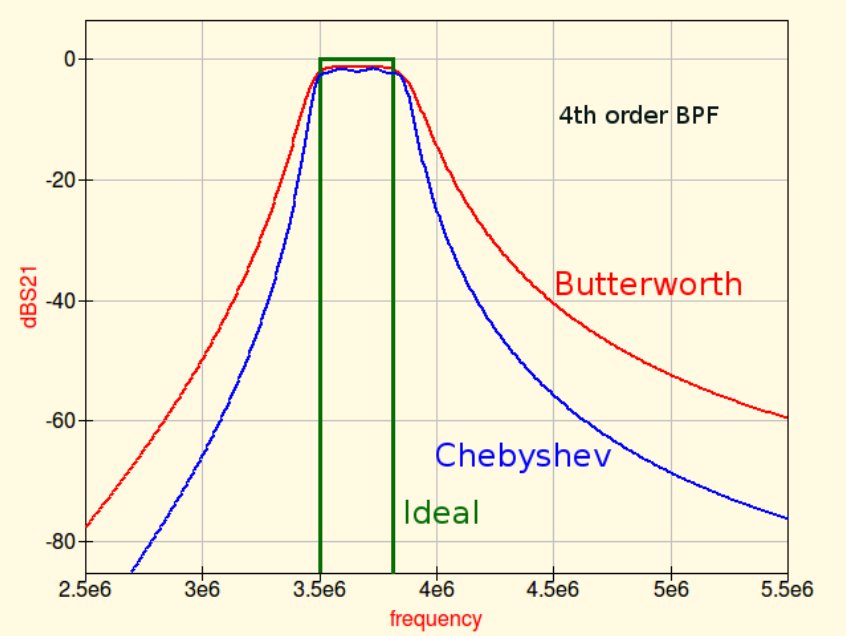


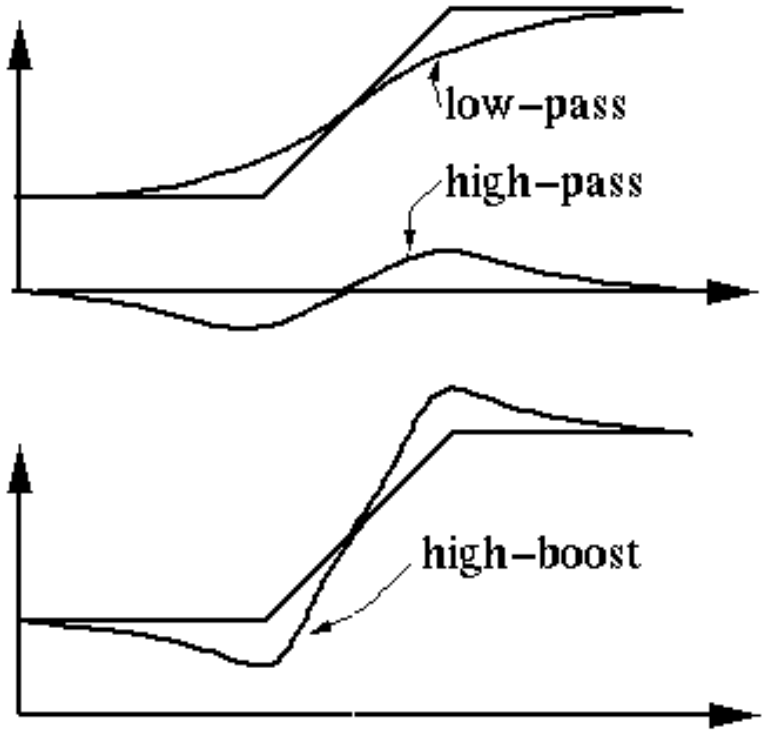
Module IV: Noise Models and Image Restoration



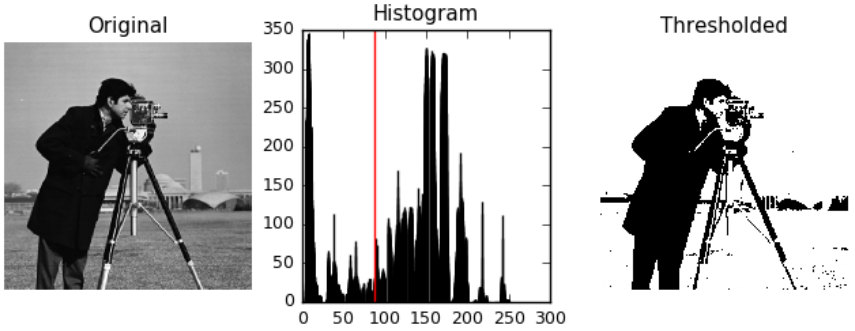


Module V: Image Restoration in Frequency Domain

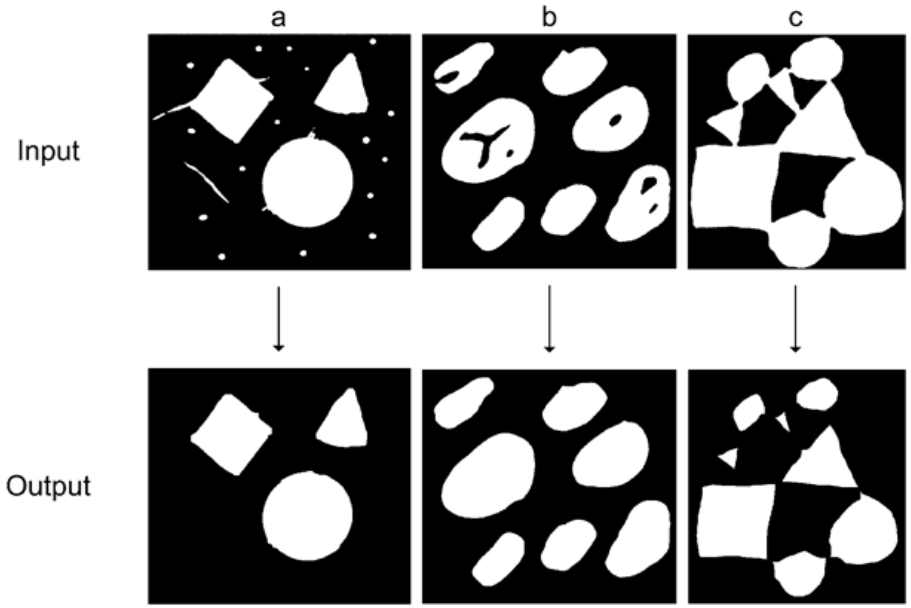




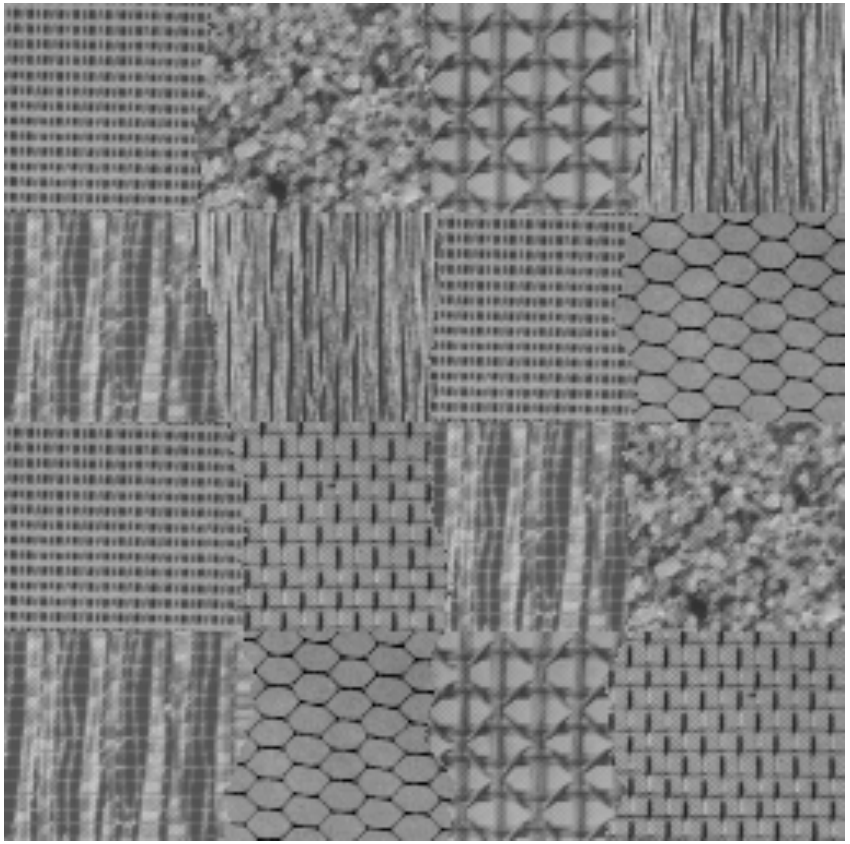
Module VI: Image Segmentation

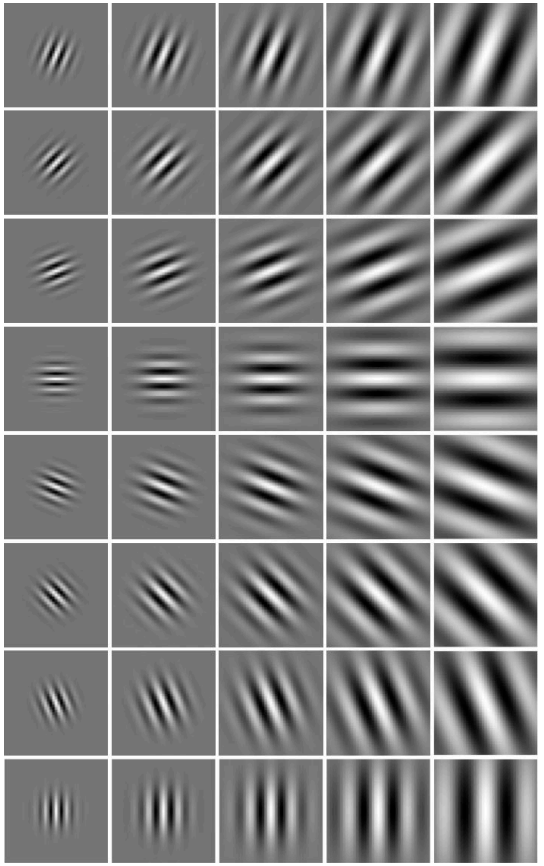


Module VII: Mathematical Morphology

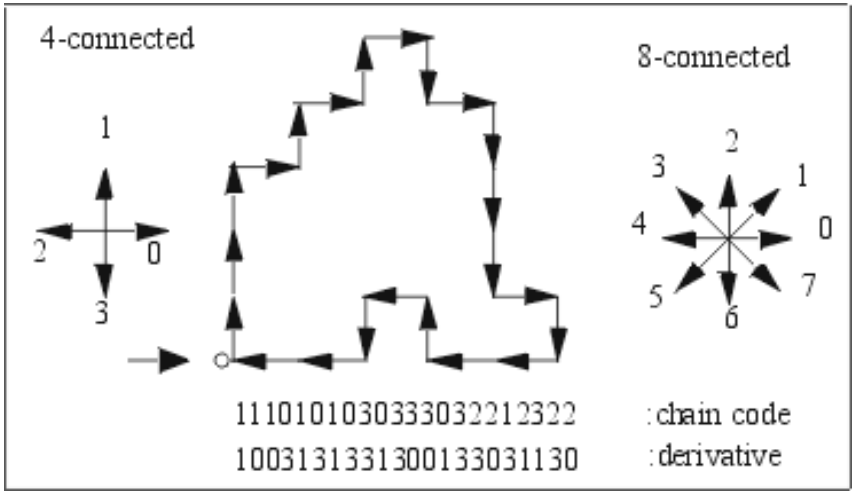


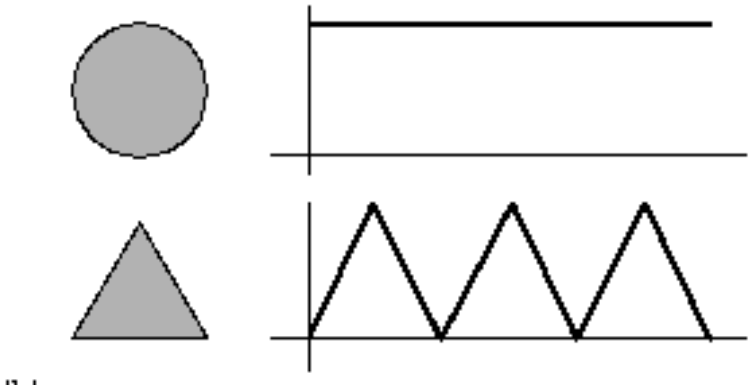
Module VIII: Textures and Wavelets



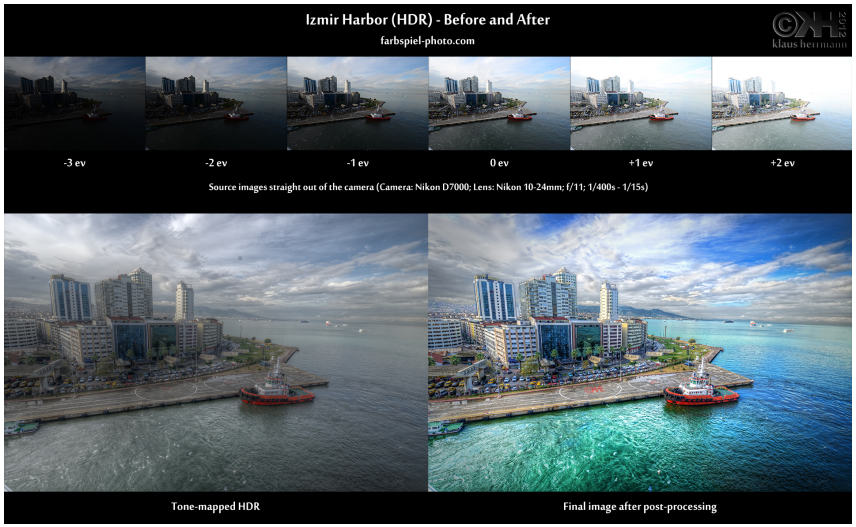


Module IX: Object Representation and Description

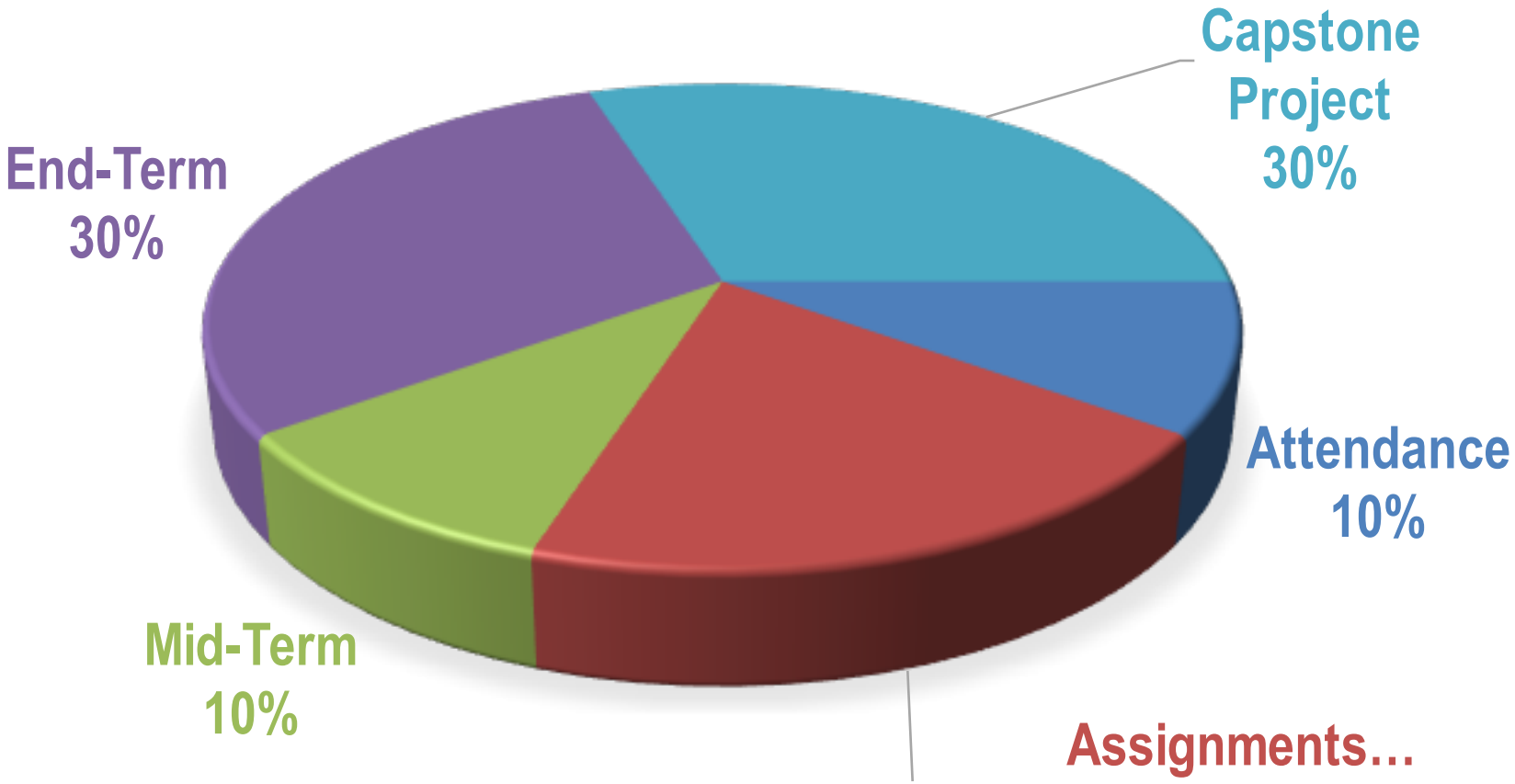




Module X: Advanced Techniques



Grading Criteria



Capstone Project

Stage 1

- Choose a project idea from the List
- Check for Allotment Confirmation from TAs

Stage 2

- Meet or email contact the Mentor
- Submit a 1 page write-up on your anticipated method

Stage 3

- Write a 4 page paper on your solution
- Present your Poster at the show and tell open day