About this course

• This course is an advanced level undergraduate course about the fundamentals of image processing.

• Requirements
  – Programming skills (C/C++, Matlab)
  – Good math background (Calculus, Linear Algebra, Statistical Methods)
  – Little or no prior knowledge of image processing techniques

• BBM 415 Introduction to Programming Practicum
  – The students will gain hands-on experience via a set of programming assignments.

• Goals of the course:
  – to provide an introduction to students who wish to specialize in interrelated disciplines like image processing, computer vision and computational photography

• Skills to develop:
  – a foundational understanding and knowledge of concepts that underlie image processing

• What is image processing?
  – What does image processing deal with?
  – Computational analysis of low and mid-level vision
### BBM 413-415 Team

**Instructor**
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**TAs**
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- **Office hours**: to be announced!

### Textbooks and Reference Material


- Lecture notes and handouts
- Papers and journal articles

### Communication

- The course webpage will be updated regularly throughout the semester with lecture notes, programming and reading assignments and important deadlines.
  
  [http://web.cs.hacettepe.edu.tr/~erkut/bbm413.f16](http://web.cs.hacettepe.edu.tr/~erkut/bbm413.f16)

### Getting Help

- **Office hours**
  - See webpage for the schedule

- **BBM 415 Image Processing Practicum**
  - Course related recitations, practice with example codes, etc.

- **Communication**
  - Announcements and course related discussions through [Piazza](https://piazza.com/hacettepe.edu.tr/fall2016/bbm413)
BBM 415 Image Processing Practicum

- **Programming assignments (PAs)**
  - Five programming assignments throughout the semester.
  - Each assignment has a well-defined goal such as solving a specific problem.
  - You must work alone on all assignments stated unless otherwise.

- **Important Dates (Tentative)**
  - PA 1: October 21st
  - PA 2: November 4th
  - PA 3: November 25th
  - PA 4: December 9th
  - PA 5: December 23rd

Policies

- **Work groups**
  - You must work alone on all assignments stated unless otherwise.

- **Submission**
  - Assignments due at 23:59 on Thursday evenings
  - Electronic submissions (no exceptions!)

- **Lateness penalties**
  - Get penalized 10% per day
  - No late submission later than 3 days after due date

Course work and grading

- **Reading assignments (5%)**
  - Reading research papers and preparing their summaries

- **Quizzes (9%)**
  - Pop-up quizzes during class

- **Course project (16%)**
  - Developing a photo editing tool
  - Done in individually or pairs

- **Midterm exam (30%)**
  - Closed book and notes
  - In class on November 24th

- **Final exam (40%)**
  - Closed book and notes
  - To be scheduled by Registrar

Course Overview

- Introduction (0.5 week)
- What is image processing? (0.5 week)
- Image formation and the digital camera (1 week)
- Color perception and color spaces (1 week)
- Point operations (1 week)
- Spatial filtering (1 week)
- Frequency Domain Techniques (2 weeks)
- Image pyramids and wavelets (1 week)
- Gradients, edges, contours (1 week)
- Image segmentation (2 weeks)
- Image smoothing (1 week)
- Advanced topics (1 week)
Image Processing

Credit: P. Milanfar