BBM 413
Fundamentals of Image Processing

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Today

• **Introduction**
  - About the class
  - Organization of this course
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 hand-on experience via a set of programming assignments.
About this course (cont’d.)

• **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

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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
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 21\(^{st}\)
  – PA 2: November 4\(^{th}\)
  – PA 3: November 25\(^{th}\)
  – PA 4: December 9\(^{th}\)
  – PA 5: December 23\(^{rd}\)
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)

Midterm exam