Welcome and Introduction

Today, images and video are everywhere. Online photo sharing sites and social networks have them in the billions. Search engines will produce images of just about any conceivable query. Practically all phones and computers come with built in cameras. It is not uncommon for people to have many gigabytes of photos and videos on their devices.

Developing computer algorithms for understanding what is in these images is the field of computer vision. Computer vision powers
applications like image search, robot navigation, medical image analysis, photo management and many more.

Welcome to CMSC389V. I am your instructor, Ali Zandifar. We will be together for the winter session. In this course, we will come together to help you to get familiar with set of programming tools to prototype computer vision and machine learning algorithms even for large-scale systems.

**Grading**

All assignments are due at **12am** on the specified day in the assignment description. If for some reason you have not been able to finish your assignment by this deadline, then you have until **9am** of the next day to submit your project with a 10% penalty. No assignments will be accepted after **9am**. Assignments are to be submitted electronically according to instructions given with the assignments. Exceptional circumstances will be considered only if discussed with the instructor **before the assignment is due**.

Final grades will be computed according the following weights. (These weights are **tentative** and subject to future adjustment.)

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<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
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<tr>
<td>Quiz #1</td>
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<td>HW#1</td>
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<td>HW#3</td>
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<tr>
<td>Project</td>
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**Course Goals**

- Computer vision, machine learning and python packages to develop an idea
- Build a data labeling system
- Mentor students to build up a new startup
References:

- Python tutorial https://docs.python.org/2/tutorial/
- Python opencv documentation http://docs.opencv.org/master/doc/py_tutorials/py_tutorials.html

Syllabus:

- Introduction to python programming
- Introduction to few python packages
  - Numpy, scipy, PIL, ObjectConfig, boto, matplotlib, opencv, scitkits
- Application I: video labeling system overview
- Image/video crawling
- Data Labeling using Mechanical Turk
- Feature detector(descriptor
- Clustering and feature Aggregator/signature
- Classifier and machine learning
- Application I: Re-visit the video labeling system
- Application II: Business card reader
- Application IV: video analytics in queue managements and retail stores
- Application V: TBA

Extra:
Mentor students to define a doable prototype within the scope of the course