Computer Vision and Robotics

CSE-437

**Course Objective**

* To understand the fundamentals of image classification, and object recognition
* Familiar with the major deep learning based algorithms involved in computer vision
* Build computer vision applications.

**Pre-requistie**

**1.** [**Statistical Learning**](https://lagunita.stanford.edu/courses/HumanitiesSciences/StatLearning/Winter2016/about)  2. [Machine Learning](https://www.coursera.org/learn/machine-learning) 3. [Linear Algebra](https://www.youtube.com/playlist?list=PL221E2BBF13BECF6C)

Syllabus

|  |  |  |
| --- | --- | --- |
| S.L | Topic | Resources |
| 1 | Computer vision overview | [Course](https://github.com/Mahedi-61/MIU_Spring_2019)  [Slides](http://cs231n.stanford.edu/syllabus.html)  [Notes](http://cs231n.github.io/)  [Book](http://neuralnetworksanddeeplearning.com/chap1.html)  [Others](http://www.dmi.usherb.ca/~larocheh/neural_networks/content.html)  [Coursera](https://www.coursera.org/specializations/deep-learning)  [Youtube](https://www.youtube.com/channel/UCYO_jab_esuFRV4b17AJtAw/playlists) |
| 2 | Image Classification (Linear and Logistic) |
| 3 | Loss Functions and Optimization |
| 4 | Introduction to Neural Networks |
| 5 | Convolutional Neural Networks |
| 6 | Training CNN-based Networks |
| 7 | Deep learning software, coding assignment |
| 8 | CNN Architectures |
| 9 | Recurrent Neural Networks |
| 10 | Object Detection and Segmentation |

**Marks Distribution**

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| --- | --- | --- | --- | --- | --- |
| S.L. | Exam | | Mark | | Syllabus |
| 1 | Midterm | | 20 | | 1 – 4 |
| 2 | Final | | 50 | | 5 - 10 |
| 3 | Coding Assignment | | - | | [Digit Recognizer](https://www.kaggle.com/c/digit-recognizer) (midterm), [CIFAR-10](https://www.kaggle.com/c/cifar-10) (final) |
| 4 | Class test | | - | | C-1 (midterm), C-2 (final) |
| 5 | Assessment | | 30 | | A1 + A2 + class test + class attendance |
| **Total** | | **100** | |  | |

**Instructor**

[Md Mahedi Hasan](http://www.mahedihasan.me/)