Introduction to Digital Image Processing

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BEng, IIESL, AMEI

Outline

- Pre-requisites
- Bibliography
- Course Outline
- Assignment-1

Pre-requisites

- Basic mathematics
- Statistics and Matrices
- Programming Skill (Python)

Bibliography

- Pattern Recognition and Machine Learning" by Christopher M. Bishop
- The Hundred-Page Machine Learning Book" by Andriy Burkov
- “Understanding Machine Learning: From Theory to Algorithms" by Shai Shalev-Shwartz and Shai Ben-David
- Any other Video/ Book/ Conference/ Journal Paper

Learning Outcomes

On completion of this module, a successful student should be able to:

1. Need of Machine Learning, introduction to Machine Learning, types of Machine Learning, such as supervised, unsupervised, and respective categories, Machine Learning Process, Machine Learning with Python, Applications of Machine Learning
2. How to use Jupyter Notebook and Python packages – Numpy, Matplotlib, Scikit-learn for data visualization and machine learning.
3. program in Python using the latest Python 3.
4. preprocess data, clean data, and analyze large data.
5. Training machine learning model.

Lectures Sessions

No	Session	Teaching Hours	Learning Outcomes	Method
1	Introduction to Machine Learning	3	1	Lecture
2	Introduction to Python for Machine Learning	6	2	Lecture|Lab
3	Supervise Learning – Regression, Classification	12	2	Lecture|Lab
4	Unsupervised Learning – Cluster Analysis, Dimension Reduction	6	3	Lecture|Lab
5	Sampling, Exploring and Cleaning and preparing data	6	3	Lecture|Lab
6	Training a machine learning model	6	4	Lecture|Lab
7				

Module Evaluation Criteria

- No final exam!
- Open Book Exam
- 3 Credits
- 4 Assignments
  - Introductory Assignment (Today) – 5%
  - Programming Assignment (In Class – 3 hrs) – 15%
  - Test (In class, Open Book) - 30%
  - Group Project (Presentation + Viva) -50%

Assignment 1 – Pre-Course