Machine Learning

Course Introduction

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Outline

- Course Information
- Video: What is Machine Learning?
- Textbook and References
- Course Objectives and Outcomes
- Course Topics
- Video: Machine Learning & Artificial Intelligence

Course Information

- **Instructor**: Prof. Gheith Abandah
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- **Home page**: http://www.abandah.com/gheith

What is Machine Learning?

- YouTube Video from Google Cloud

https://youtu.be/HcqpanDadyQ

Textbook and References

- **Textbooks:**
  1. Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow: Concepts: Tools, and Techniques to Build Intelligent Systems, 2nd Edition, O'Reilly Media, Oct 2019. (PDF)
  2. François Chollet, Deep Learning with Python, Manning Pub. 2018.
- **References**:
  1. Prateek Joshi, Artificial Intelligence with Python, Packt Publishing, 2017.
  2. Theodoridis S, Koutroumbas K, Pattern Recognition, 3rd ed. Academic Press, 2006.
  3. Richard O. Duda, Peter E. Hart and David G. Stork, Pattern Classification, 2nd ed. Wiley Interscience, 2001.
- **Course web page**:

  http://www.abandah.com/gheith/?page_id=2422

Course Objectives

- Introduce students to the techniques used in ML including data preparation, training models, classification, neural networks, and deep learning.
- Introduce students to the practical techniques used in developing ML systems including sample collection, training, and evaluation.
- Introduce students to the programming techniques and libraries used in ML (Python, Scikit-Learn, Keras, and TensorFlow).

Course Outcomes

- Solve an AI problem by developing an appropriate ML system.
- Communicate the development of a ML system through a detailed technical report and a short presentation.
- Use Python and its specialized libraries to develop programs for solving ML problems.

Course Outline

- Introduction
- ✓ Python programming language
- Data preparation and regression
- Classification
- Training models
- Classical techniques: SVM, decision trees and ensembles
- Neural networks

Midterm Exam

- Deep neural networks
- Convolutional neural networks
- Recurrent neural networks
- Reinforcement learning
- Recommendation systems

Machine Learning & Artificial Intelligence

- YouTube Video from CrashCourse

https://youtu.be/z-EtmaFJieY