Introduction to Machine Learning: Load to AI

Jin Hyun Kim

This Course

- 인공지능개론 (FIA 00021), 3 points
- Tue 6, 7, Thu 5
- Professor:
  - Jin Hyun Kim 김진현 (해양과학관 804호)
  - jin.kim@gnu.ac.kr

This Class

- This class will focus on AI technologies including Machine learning.
- AI is a computer-based intelligence system that learns an algorithm to solve problems.
- AI technologies are dramatically advanced recently thanks to Neural Network and Deep Learning techniques.
- This class will cover the fundamentals on Machine Learnin g and programming for Machine Learning models.

Topic

- Introduction to AI and Machine Learning
- Mathematical Notation for Machine Learning
- Neural Network
- Machine Learning Programming (Python, Numpy, Pandas, …)
- Linear Regression, Sigmoid, …
- Convolution NN
- Recurrent NN
- Transfer Learning

Text

- The Hundred-Page Machine Learning Book, 수식과 간결한 설명을 바탕으로 하는 핵심 머신 러닝
  - 에이콘 출판사, Andriy Burkov
  - http://themlbook.com/wiki/doku.php
- 부교재) 장교수의 딥러닝
  - (저) 장병탁, 홍릉과학출판사

소통 Communications

- Class homepage: https://jinkimh.github.io/ai/
  - Introduction, Lectures, Readings, etc …
- All submissions shall be on **Google Classroom**
  - **Google classroom:** sakj7y6

Grading

- Assignments 30%
  - 과제의 카피 적발 1회시 10% 감점
  - 카피 적발 3회시 전체 성적의 30% 감점
- Mid and Final Evaluation Each 30% (Including written exam)
- Presence 10%
  - 7 times non-presence: F
  - % (1 time late -1%, 5 time late 10%)

Lecture Plan

Week	Contents	Text	실습
1	Introduce to Class and Machine Learning, Python I – Basics	Lecture Note for Python I	
2	Python II – Functions, Numpy, Matrix Notation and Definition (수학적 정의와 표기법)	Lecture Note for Python II Ch 2	
3	Linear Regression, Logistic Regression, Decision Tree, SVM	Ch 3	Lab 1 – Tensorflow + Keras
4	Anatomy of a Learning Algorithm	Ch 4	
5	Core Techniques	Ch 5	Using Tensorflow, implementation of linear regression
6	Small Project		Using Tensorflow, implementation of linear regression with Kaggle data
7	Neural Network I	Ch 6	
8	Mid-term Exam		
9	Neural Network II	Ch 6	
10	Convolution Neural Networks	부교재 Ch 4~6	
11	CNN Model with Medical Data		CNN with OCT Medical data
12	Recurrent Neural Networks	부교재 Ch 7	
13	RNN Model with Stock Data		RNN with OCT Stock data
14	Reinforcement Learning I	부교재 Ch 8	
15	Reinforcement Learning II		
16	Final Exam		

First Homework

- Sign up Google Classroom (sakj7y6)
- Install Anaconda and learn Jupyter as soon as possible
- Try to use Linux, e.g. Ubuntu

Next Class

- Next, we will learn how to write Python code …