Introduction to Machine Learning

Introduction

- **Professor:** 이지형**(Lee, Jee-Hyong)**
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- **Textbook:**
  - Any books on Machine Learning

    $Data \rightarrow$ "patterns in data"

- **Prerequisite:**
  - C/Java Programming, Probability & Statistics, Linear Algebra, Calculus ..

There are huge amount of topics in ML

- **k-Nearest Neighbor (Classification, Regression)**
- **Regression (Linear, Polynomial …)**
- **Cross Validation**
- **Probability, Naïve Bayesian, Maximum Likelihood**
- **Neural Network, RBF Neural Network, Deep Learning**
- **Support Vector Machine, Support Vector Regression**
- **Decision Tree, Regression Tree**
- **Dimensionality Reduction: PCA**
- **k-Means Clustering, Gaussian Mixture Model**
- **Graph Clustering**
- **Hidden Markov Model**
- **Meta Learning: Bagging, Boosting, Adaboost**
- **Set Clustering (Latent Semantic Analysis, PLSA, LDA)**
- **Feature Selection**
- **Association Rule Mining**
- **Semi-supervised Learning**
- **Reinforcement Learning**
- **Sampling & MCMC**
- **…**

< Deep Learning (DNN)
Deep Neural Network

Tentative Schedule

- **Introduction, k-Nearest Neighbor**
- **Polynomial Regression, Kernel Regression**
- **Cross Validation**
- **Probability, Naïve Bayesian, Maximum Likelihood**
- **Gradient Descent Method, Logistic Regression**
- Neural Network
- **Support Vector Machine, Support Vector Regression**
- **Decision Tree, Regression Tree, Random Forest**
- **k-Means Clustering, Gaussian Mixture Model**
- **Matrix Manipulation, Dimensionality Reduction**
- Hidden Markov Model
- **Meta Learning: Bagging, Boosting, Adaboost**

Some Notices

- **Evaluation (Tentative):**
  - HW: $(10 + \alpha)$%, Mid: $(40 + \beta)$%, Final: $(40 + \gamma)$%, Attendance: $(10 + \gamma)$%
  - $\alpha, \beta, \gamma, \delta$ are not determined yet

- **Warning:**
  - You can discuss with your friends for your HWs
  - But, do it by yourself
  - If copies are found, both will have a MINUS score not a zero

- **All notices and homework will be posted on icampus.skku.edu**

- **Everything is subject to change without notice**

Tentative !!

"No In-person Classes"
But
"Pre-recorded Classes"

Mid-Term Exam

Final Exam

Sun	Mon	Tue	Wed	Thu	Fri	Sat
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21