204456: Machine Learning

Ch00 - Course Admin

Jakramate Bootkrajang

Department of Computer Science
Chiang Mai University

Instructor

- Name: Jakramate Bootkrajang

- Office: CSB107

- Office hours: 15.30 - 16.30 (Tuesday, Friday)

- Email: `jakramate.b@cmu.ac.th`

About the course

- Meeting: 11.00 - 12.30 (Tuesday, Friday) at CSB 202
  - 10 mins (Q&A) 60 mins (Lecture) 10 mins (Q&A)

- Course webpage: `https://www2.cs.science.cmu.ac.th/staff/jakramate/courses/2019/cs456/ml.html`

- Course description: Basic concepts of machine learning, supervised learning, unsupervised learning, evaluating machine learning algorithms, algorithm independent analysis and reinforcement learning

Prerequisite

- Linear algebra: vector, matrix, inverse of a matrix, matrix trasposition

- Calculus: derivative, partial derivative, gradient

- Statistics: Normal (Gaussian) distribution, variance, expected value, random variable

- Programming: Any languages you like, Python (main language), Google's colab, Anaconda distribution

Course objectives

students are able to

1 describe the difference between major tasks in machine learning.

2 select appropriate algorithm/model for the task.

3 implement the algorithm/model for solving the task.

Materials

- Slides will be available via course's webpage

- Textbook (coming soon)

- Recommended books:
  - Machine learning (Tom Mitchell)

  - Pattern Recognition and Machine Learning (Christopher Bishop)

  - Foundations of Machine Learning (Mehryar Mohri et al.)

Schedule: midterm

Date	Lecture	Date	Lecture
17 Dec	Admin	20 Dec	Intro to ML
24 Dec	Math refresher	27 Dec	Regression
31 Dec	Holiday (1)	3 Jan	Holiday (2)
7 Jan	Classification	10 Jan	Linear Least Square
13 Jan	SVM + Kernel	17 Jan	Logistic Regression
20 Jan	Naive Bayes	24 Jan	Discriminant Analysis
27 Jan	Neural Networks	31 Jan	Backpropagation
4 Feb	Deep learning (1)	7 Feb	Deep learning (2)
11 Feb	Classifier evaluation	14 Feb	Model selection
18 Feb	Midterm exam period	21 Feb	Midterm exam period

Schedule: final

Date	Lecture	Date	Lecture
25 Feb	Clustering, k-means	28 Feb	Gaussian Mixture Model
3 Mar	Cluster evaluations	6 Mar	Dimensionality Reduction
10 Mar	PCA	13 Mar	ICA
17 Mar	Bias/Variance Trade-off	20 Mar	Regularisation
24 Mar	Reinforcement learning	27 Mar	Markov Process
31 Mar	Markov Decision Process	3 Apr	Value-iteration
6 Apr	Q-learning	10 Apr	RL case study
14 Apr	Holiday (1)	17 Apr	Holiday (2)
20 Apr	Final exam period	3 May	Final exam period

Grading

- Assignments: 30%

- Midterm: 35%

- Final: 35%

Homework

- Form a team of 2 (or 3) and compete via Kaggle competition platform `www.kaggle.com`

- First assignment (system testing)
  `https://www.kaggle.com/c/twing` (do not use this link for submission, use the link provided on the course webpage instead)

Q&A ?