

授業科目名 <英訳>	Statistical Learning Theory Statistical Learning Theory				担当者所属・ 職名・氏名	情報学研究科 教授 鹿島 久嗣					
配当 学年	1回生以上	単位数	2	開講年度・ 開講期	2017・ 前期	曜時限	月1	授業 形態	講義	使用 言語	英語
授業種別											
【授業の概要・目的】											
<p>This course will cover in a broad sense the fundamental theoretical aspects and applicative possibilities of statistical machine learning, which is now a fundamental block of statistical data analysis and data mining. This course will focus first on the supervised and unsupervised learning problems, including a survey of probably approximately correct learning, Bayesian learning as well as other learning theory frameworks. Following this introduction, several probabilistic models and prediction algorithms, such as the logistic regression, perceptron, and support vector machine will be introduced. Advanced topic such as online learning, structured prediction, and sparse modeling will be also introduced.</p>											
【到達目標】											
Understanding basic concepts, problems, and techniques of statistical learning and some of the recent topics.											
【授業計画と内容】											
<p>1. Statistical Learning Theory 1-1. Introduction to classification & regression: historical perspective, separating hyperplanes and major algorithms 1-2. Probabilistic framework of classification and statistical learning theory: Learning Bounds, Vapnik-Chervonenkis theory</p> <p>2. Supervised Learning 2-1 Models for Classification: Logistic Regression, Perceptron, Support Vector Machines 2-2 Regularization: Sparse Models (L1 regularization), Bayesian Modeling 2-3 Model Selection: Performance Measures, Cross-Validation, and Other Information Criterion</p> <p>3. Advanced topics 3-1 Structured Prediction: Conditional Random Fields, Structured SVM 3-2 Online learning 3-3 Semi-supervised, Active, and Transfer Learning</p>											
【履修要件】											
特になし											
【成績評価の方法・観点及び達成度】											
Reports and final exam.											
【教科書】											
授業中に指示する											
----- Statistical Learning Theory(2)へ続く -----											

Statistical Learning Theory(2)

[参考書等]

(参考書)

Hastie, Friedman, Tibshirani 『The Elements of Statistical Learning』 (Springer)

Shai Shalev-Shwartz and Shai Ben-David 『Understanding Machine Learning: From Theory to Algorithms』
(Cambridge University Press)

[授業外学習(予習・復習)等]

Basic knowledge about probability and statistics

(その他(オフィスアワー等))

オフィスアワーの詳細については、KULASISで確認してください。