ML Methods

Please find below a list of ML methods that you can choose from for your ML project.

If your desired methods are not in the lists below, please get in touch with us on Slack. We could consider added those into the lists if they are touched upon in the lectures or assignment.

Course book: mlbook.cs.aalto.fi

Classification methods

Name	Map	Loss	SK-Learn class	book
K-Nearest Neighbors	Piece-wise constant around training data points.	0/1 loss	KNeighborsClassifier	3.13
Logistic Regression	Linear maps	Logistic loss	LogisticRegression	3.6
Decision Tree	maps represented by a signal flow chart ("tree") that takes in features and maps them to a prediction by executing a series of " if/else" decisions.	Gini impurity/ Information gain	DecisionTreeClassifier	3.10
SVC	linear maps	Hinge loss	SVC	3.7
multi-layer perceptron	Linear maps + linear/nonlinear activation functions	Logistic loss	MLPClassifier	3.11

Linear methods

Name	Map	Loss	SK-Learn class	ML book
Linear Regression	linear maps	squared error	LinearRegression	3.1
Polynomial Regression	polynomial maps	squared loss	PolynomialFeatures + LinearRegression	3.2
Huber Regression	linear maps	Huber loss	HuberRegressor	3.3
Ridge Regression	linear maps	Mean squared error loss regularised by L2-norm	Ridge	7.1, 7.4, 7.8.1. 3.4
Lasso Regression	linear maps	squared error plus L1-norm of parameters	Lasso	3.4, 7.1
Decision Tree	maps represented by a signal flow chart ("tree") that takes in features and maps them to a prediction by executing a series of "if/else" decisions.	squared error	DecisionTreeRegressor	-
Multi-layer Perceptron	map represented by a signal flow chart or "artificial neural network"	squared error	MLPRegressor	3.11

Clustering

Name	SK-Learn class	ML book
k-means	KMeans	8.1
DBSCAN	DBSCAN	8.3

Feature Learning

Name	SK-Learn class	ML book
Principal component analysis	PCA	9.2

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« Previous activity
Reference ML project...

Next activity »
Stage 1 late submiss...