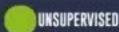
# MACHINE LEARNING IN EMOJI



SUPERVISED







human builds model based on input / output

UNSUPERVISED

human input, machine output human utilizes if satisfactory

human input, machine output human reward/punish, cycle continues



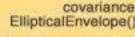
cluster.KMeans()

Similar datum into groups based on centroids





Finding outliers through grouping











## BASIC REGRESSION

REINFORGEMENT



linear model.LinearRegression()

Lots of numerical data









linear\_model.LogisticRegression()

Target variable is categorical





#### CLASSIFICATION



**NEURAL NET** 

neural network.MLPClassifier()

Complex relationships. Prone to overfitting Basically magic.





neighbors.KNeighborsClassifier()

Group membership based on proximity





DECISION TREE

tree DecisionTreeClassifier()

If/then/else. Non-contiguous data Can also be regression







RANDOM FOREST

ensemble.RandomForestClassifier()

Find best split randomly Can also be regression











SVM

svm.SVC() svm.LinearSVC()

Maximum margin classifier. Fundamental Data Science algorithm





IAWE BAYS GaussianNB() MultinomialNB() BernoulliNB()

Updating knowledge step by step with new info



### **FEATURE REDUCTION**

T-BISTRIB STOCHASTIC NEW EMBEDDING

manifold.TSNE()

Visualize high dimensional data. Convert similarity to joint probabilities



PRINCIPLE COMPONENT ANALYSIS

decomposition. PCA()

Distill feature space into components that describe greatest variance



#### CANONICAL CORRELATION ANALYSIS

decomposition.CCA()

Making sense of cross-correlation matrices



LINEAR DISCRIMINANT ANALYSIS

Linear combination of features that separates classes



#### OTHER IMPORTANT CONCEPTS

BIAS VARIANCE TRADEOFF

UNDERFITTING / OVERFITTING

ACCURACY FUNCTION

(TP + TN)/(P + N)

PRECISION FUNCTION

TP / (TP + FP)

SPECIFICITY FUNCTION

TN / (FP + TN)

SENSITIVITY FUNCTION

TP / (TP + FN)

