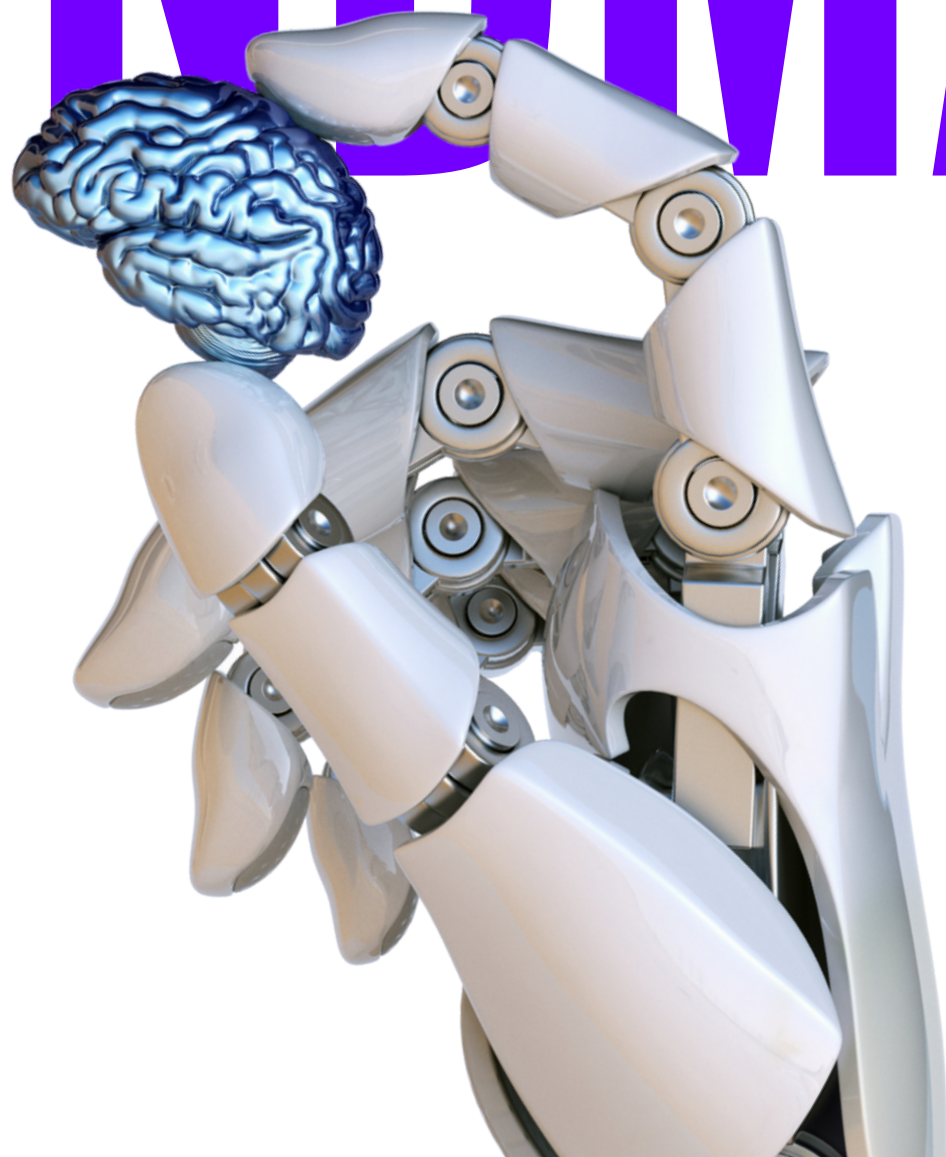
MACHINE LEARNING INDIA

MACHINE LEARNING ALGORITHMS MINDMAP



Exhaustive list!

This post is an attempt to provide an exhaustive list of machine learning algorithms and methods. We understand that getting started with machine learning can be enervating and finding the right algorithm or technique could be deceptive, and therefore we hope that this summary gives you all - a baseline to choose the right algorithm for your requirements. Note: Most of the listed algorithms are versatile and **multipurpose**.

Regression and Regularization:

- Ordinary least squares regression.
- Linear regression.
- Polynomial regression.
- Stepwise regression.
- Locally estimated scatter-plot smoothing.
- Support vector regression.
- Multivariate adaptive regression splines.
- Quantile regression.
- Ridge regression.
- LASSO regression.
- Elastic-net regression.
- Least-angled regression.

Bayesian Algorithms:

- Naive Bayes.
- Averages one-dependence estimators.
- Bayesian belief networks.
- Gaussian naive Bayes.
- Multinomial naive Bayes.
- Bayesian networks.

Trees and Ensembles:

- Classification and regression trees.
- Iterative dichotomisers.
- Decision stump.
- Random forests.
- Gradient boosting machines.
- Boosting.
- Bootstrapped aggregation (bagging).
- Ada-boost.
- Stacked generalization (blending).

Dimensionality Reduction:

- Principal component analysis.
- Sammon mapping.
- Multidimensional scaling.
- Projection pursuit.
- Linear discriminant analysis.
- Partial least squares regression.

Clustering and instance-based:

- K-means clustering.
- K-medians clustering.
- Expectation maximization.
- Hierarchical clustering.
- K-nearest neighbor.
- Self-organizing maps.
- Learning vector quantization.
- Locally-weighted learning.

Other significant algorithms:

- Support vector machines.
- Logistic regression.
- Perceptron.
- Gradient descent.
- Backpropagation.
- Apriori algorithm.
- FP-Growth.
- Hidden Markov models.
- Poisson regression.
- Alternating least-squares.
- Gaussian mixture models.
- DBSCAN.
- Singular value decomposition.
- Latent Dirichlet analysis.

Computational complexities:

Algorithm	Classification/Regression	Training	Prediction
Decision Tree	C+R	$O(n^2p)$	$O(p)$
Random Forest	C+R	$O(n^2pn_{trees})$	$O(pn_{trees})$
Random Forest	R Breiman implementation	$O(n^2pn_{trees})$	$O(pn_{trees})$
Random Forest	C Breiman implementation	$O(n^2\sqrt{p}n_{trees})$	$O(pn_{trees})$
Extremly Random Trees	C+R	$O(npn_{trees})$	$O(npn_{trees})$
Gradient Boosting (n_{trees})	C+R	$O(npn_{trees})$	$O(pn_{trees})$
Linear Regression	R	$O(p^2n + p^3)$	$O(p)$
SVM (Kernel)	C+R	$O(n^2p + n^3)$	$O(n_{sv}p)$
k-Nearest Neighbours (naive)	C+R	–	$O(np)$
Nearest centroid	C	$O(np)$	$O(p)$
Neural Network	C+R	?	$O(pn_{l_1} + n_{l_1}n_{l_2} + \dots)$
Naive Bayes	C	$O(np)$	$O(p)$

Source: The Future of Computation for Machine Learning and Data Science on https://www.experfy.com/

Easier to remember:

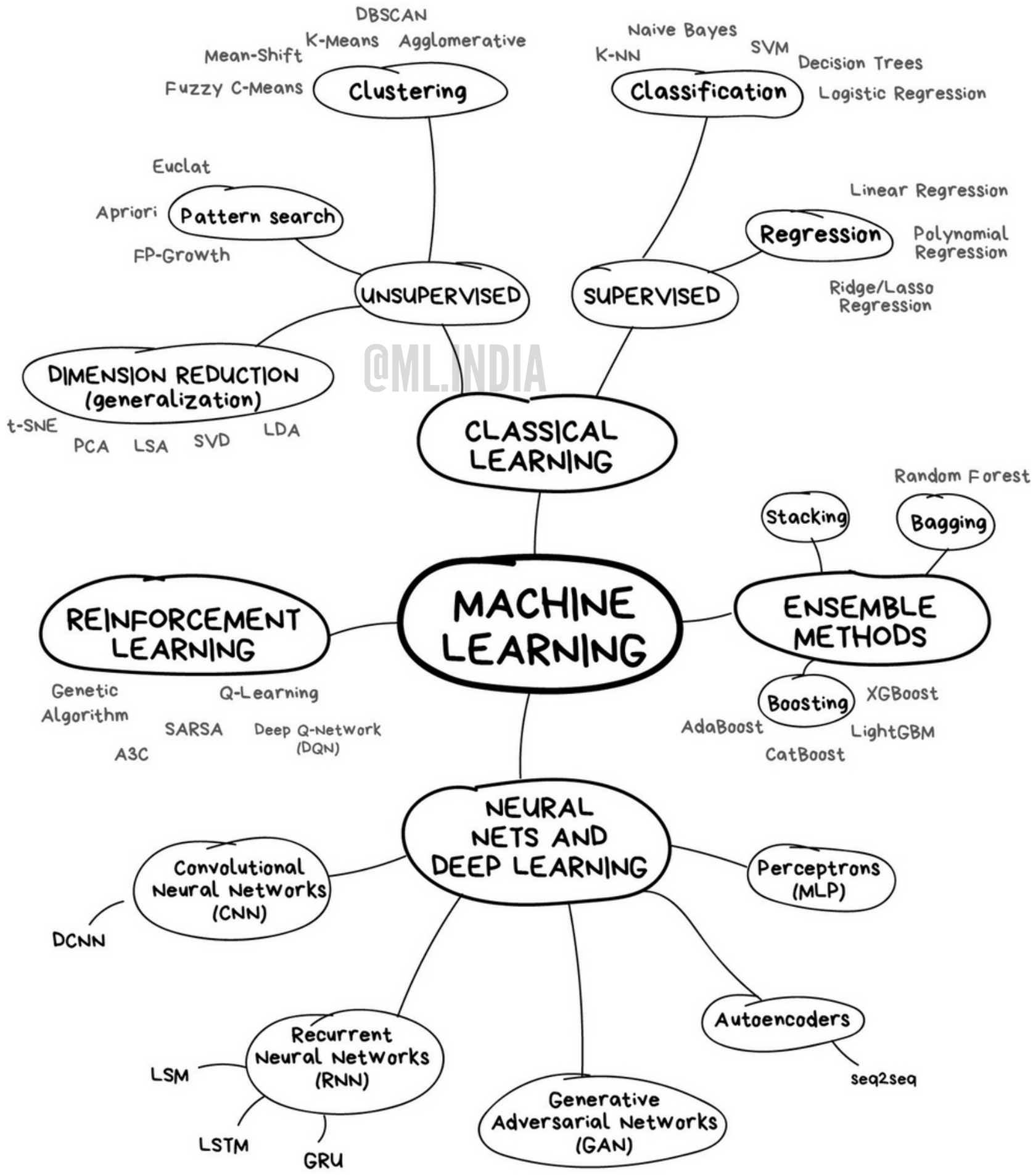


Image by vas3k.

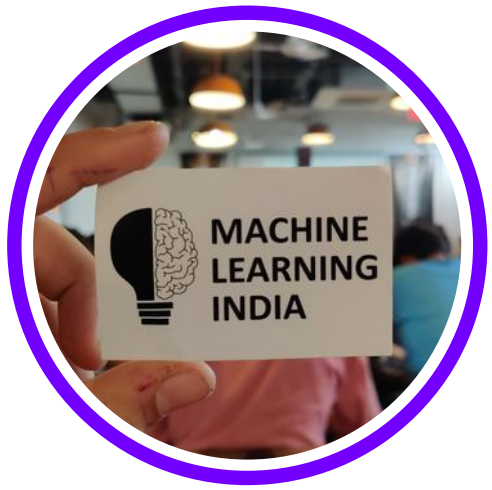
Some references:

- Machine Learning algorithms mind-map by **MachineLearningMastery.com**.

- Which Machine Learning Algorithm Should I Use? by **Hui Li** on **KDNuggets.com**.

Important note:

The links to these resources will be put up on our Telegram. Channel ID: **@machinelearning24x7**.



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