Learning Path: ML

Machine Learning Learning Path

This learning path provides a structured approach to learning Machine Learning (ML), starting with foundational concepts and progressing to more advanced topics.

Phase 1: Foundational Knowledge (4 weeks)

* **Mathematics:**

    * Linear Algebra (Khan Academy, 3Blue1Brown): Vectors, matrices, eigenvalues.

    * Calculus (Khan Academy, MIT OpenCourseware): Derivatives, integrals, gradients.

    * Probability & Statistics (Khan Academy): Distributions, hypothesis testing, Bayesian inference.

* **Programming:**

    * Python (Codecademy, Google's Python Class): Data structures, control flow, libraries (NumPy, Pandas).

* **Introduction to ML:**

    * Book: "Hands-On Machine Learning with Scikit-Learn, Keras & TensorFlow" by Aurélien Géron.

    * Course: Andrew Ng's Machine Learning course on Coursera.

Phase 2: Core Algorithms (6 weeks)

* **Supervised Learning:**

    * Regression (Linear, Logistic): StatQuest videos on YouTube.

    * Classification (Decision Trees, SVM, Naive Bayes): Scikit-learn documentation.

* **Unsupervised Learning:**

    * Clustering (K-means, Hierarchical): Stanford CS229 lecture notes.

* Dimensionality Reduction (PCA, t-SNE): Scikit-learn examples.

* **Model Evaluation & Validation:**

    * Cross-validation, metrics (accuracy, precision, recall): Towards Data Science articles.

Phase 3: Advanced Topics (8 weeks)

* **Deep Learning:**

    * Book: "Deep Learning with Python" by Francois Chollet.

    * Course: Deeplearning.ai specialization on Coursera.

* **Reinforcement Learning:**

    * Book: "Reinforcement Learning: An Introduction" by Sutton and Barto.

    * Course: David Silver's Reinforcement Learning course on YouTube.

* **Specific Applications:**

    * Natural Language Processing (NLP): Stanford NLP course.

    * Computer Vision: CS231n: Convolutional Neural Networks for Visual Recognition.

This learning path provides a starting point. Adjust the timeline and resources based on your learning style and goals. Continuous practice and project work are crucial for solidifying your understanding.