Machine Learning Crash Course

Google's fast-paced, practical introduction to machine learning, featuring a series of lessons with video lectures, interactive visualizations, and hands-on practice exercises.

urse modules (https://developers.google.com/machine-learning/crash-course#course-modules) View prerequisites (https://developers.google.com/machine-le

100+ exercises

12 modules

15 hours

Video explainers of ML concepts

Real-world examples

Interactive visualizations

What's new in Machine Learning Crash Course?

Since 2018, millions of people worldwide have relied on Machine Learning Crash Course to learn how machine learning works, and how machine learning can work for them. We're delighted to announce the launch of a refreshed version of MLCC that covers recent advances in AI, with an increased focus on interactive learning. Watch this video to learn more about the new-and-improved MLCC.

Machine Learning Crash Course: Intro & What's ...

Course Modules

Each Machine Learning Crash Course module is self-contained, so if you have prior experience in machine learning, you can skip directly to the topics you want to learn. If you're new to machine learning, we recommend completing modules in the order below.

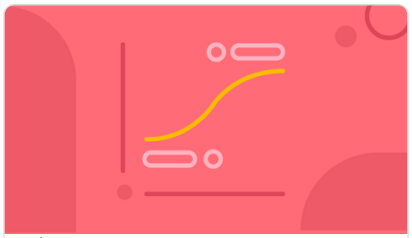
ML Models

These modules cover the fundamentals of building regression and classification models.


(https://developers.google.com/machine-learning/crash-course/linear-regression)

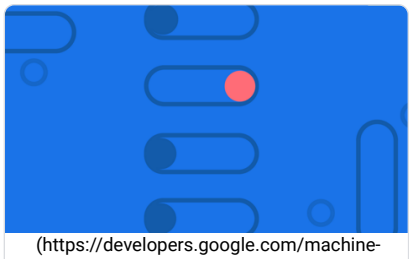
Linear Regression
(https://developers.google.com/machine-learning/crash-course/linear-regression)

An introduction to linear regression, covering linear models, loss, gradient descent, and hyperparameter tuning.


(https://developers.google.com/machine-learning/crash-course/logistic-regression)

Logistic Regression
(https://developers.google.com/machine-learning/crash-course/logistic-regression)

An introduction to logistic regression, where ML models are designed to predict the probability of a given outcome.

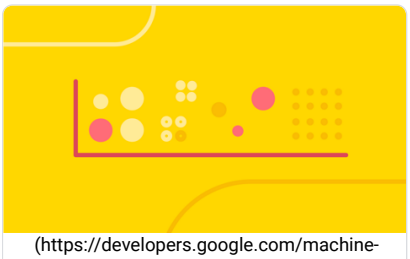

(https://developers.google.com/machine-learning/crash-course/classification)

Classification
(https://developers.google.com/machine-learning/crash-course/classification)

An introduction to binary classification models, covering thresholding, confusion matrices, and metrics like accuracy, precision, recall, and AUC.

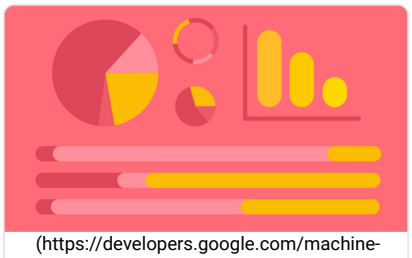
Data

These modules cover fundamental techniques and best practices for working with machine learning data.


(https://developers.google.com/machine-learning/crash-course/numerical-data)

Working with Numerical Data
(https://developers.google.com/machine-learning/crash-course/numerical-data)

Learn how to analyze and transform numerical data to help train ML models more effectively.


(https://developers.google.com/machine-learning/crash-course/categorical-data)

Working with Categorical Data
(https://developers.google.com/machine-learning/crash-course/categorical-data)

Learn the fundamentals of working with categorical data: how to distinguish categorical data from numerical data; how to represent categorical data numerically using one-hot encoding, feature hashing, and mean encoding; and how to perform feature crosses.

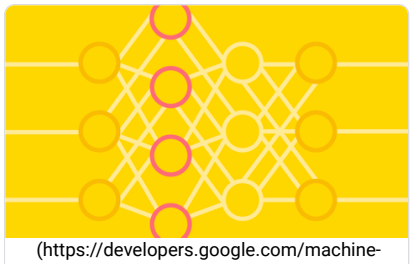

(https://developers.google.com/machine-learning/crash-course/overfitting)

Datasets, Generalization, and Overfitting
(https://developers.google.com/machine-learning/crash-course/overfitting)

An introduction to the characteristics of machine learning datasets, and how to prepare your data to ensure high-quality results when training and evaluating your model.

Advanced ML models

These modules cover advanced ML model architectures.

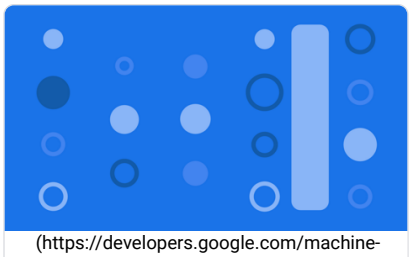


(https://developers.google.com/machine-learning/crash-course/neural-networks)

Neural Networks

(https://developers.google.com/machine-learning/crash-course/neural-networks)

An introduction to the fundamental principles of neural network architectures, including perceptrons, hidden layers, and activation functions.



(https://developers.google.com/machine-learning/crash-course/embeddings)

Embeddings

(https://developers.google.com/machine-learning/crash-course/embeddings)

Learn how embeddings allow you to do machine learning on large feature vectors.

(https://developers.google.com/machine-learning/crash-course/llm)

NEW

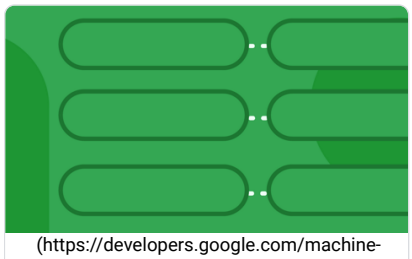
Large Language Models

(https://developers.google.com/machine-learning/crash-course/llm)

An introduction to large language models, from tokens to Transformers. Learn the basics of how LLMs learn to predict text output, as well as how they're architected and trained.

Real-world ML

These modules cover critical considerations when building and deploying ML models in the real world, including productionization best practices, automation, and responsible engineering.



(https://developers.google.com/machine-learning/crash-course/production-ml-systems)

Production ML Systems

(https://developers.google.com/machine-learning/crash-course/production-ml-systems)

Learn how a machine learning production system works across a breadth of components.

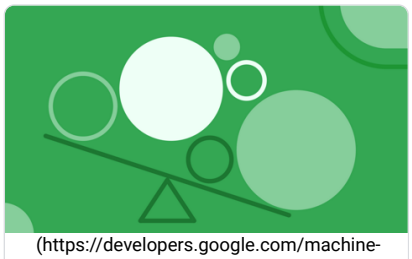
(https://developers.google.com/machine-learning/crash-course/automl)

NEW

AutoML

(https://developers.google.com/machine-learning/crash-course/automl)

Learn principles and best practices for using automated machine learning.



(https://developers.google.com/machine-learning/crash-course/fairness)

ML Fairness

(https://developers.google.com/machine-learning/crash-course/fairness)

Learn principles and best practices for auditing ML models for fairness, including strategies for identifying and mitigating biases in data.