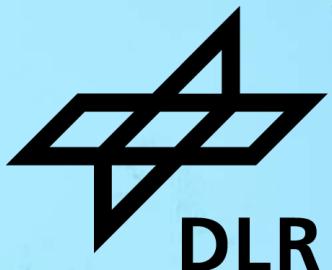


INTRODUCTION TO DEEP LEARNING

PART V – CODE AND KNOWLEDGE SOURCES

Auliya Fitri, Sai Vemuri, Sreerag Naveenachandran

**Machine Learning Group
Institute of Data Science**



Schedule



Date	Time	Activity
13.11.2025 Day 1	09:00 - 10:00	Introduction and basics
	10:00 - 10:30	Hands-on I
	10:30 - 10:45	Coffee break
	10:45 - 11:45	Advanced concept and Convolutional Neural Network
	11:45 - 12:15	Hands-on II
	12:15 - 12:30	Recap Day 1
14.11.2025 Day 2	09:00 - 10:00	Deep Generative Model
	10:00 - 10:30	Hands-on III
	10:30 - 10:45	Coffee break
	10:45 - 11:45	Transformer
	11:45 - 12:15	Hands-on IV
	12:15 - 12:30	Code and knowledge sources + closing

We're here!

Code & knowledge sources

Code: Github

- Many free implementations of popular and new methods
- Many conferences now require public code for reproducibility
- Usually a good first step for testing and adapting a new method

See the [YOLOv5 Docs](#) for full documentation on training, testing, and deployment. See below for quickstart examples.

▼ Install

Clone the repository and install dependencies in a [Python>=3.8.0](#) environment. Ensure you have [PyTorch>=1.8](#) installed.

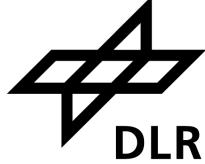
```
# Clone the YOLOv5 repository  
git clone https://github.com/ultralytics/yolov5  
  
# Navigate to the cloned directory  
cd yolov5  
  
# Install required packages  
pip install -r requirements.txt
```

▼ Inference with PyTorch Hub

Use YOLOv5 via [PyTorch Hub](#) for inference. [Models](#) are automatically downloaded from the latest YOLOv5 [release](#).

```
import torch  
  
# Load a YOLOv5 model (options: yolov5n, yolov5s, yolov5m, yo  
model = torch.hub.load("ultralytics/yolov5", "yolov5s") # De  
  
# Define the input image source (URL, local file, PIL image,  
img = "https://ultralytics.com/images/zidane.jpg" # Example  
  
# Perform inference (handles batching, resizing, normalizatio  
results = model(img)  
  
# Process the results (options: .print(), .show(), .save(), .  
results.print() # Print results to console  
results.show() # Display results in a window  
results.save() # Save results to runs/detect/exp
```

► Inference with detect.py



Code & knowledge sources

Knowledge: arXiv

- Now often the first point of publication for DL papers (sometimes the only one)
- Not peer-reviewed!
- Helpful tool:
- <http://www.arxiv-sanity.com/>

The screenshot shows a browser window displaying an arXiv preprint. The title of the paper is "What is YOLOv5: A deep look into the internal features of the popular object detector" by Rahima Khanam and Muhammad Hussain. The paper was submitted on 30 Jul 2024. It features two main download links: "View PDF" and "HTML (experimental)". The abstract discusses the comprehensive analysis of the YOLOv5 object detection model, its architecture, training methodologies, and performance across various metrics and hardware platforms. The paper also explores the transition from Darknet to PyTorch and its impact on model development. The subjects listed are Computer Vision and Pattern Recognition (cs.CV). The submission history indicates it was submitted by Rahima Khanam on Tue, 30 Jul 2024 at 15:09:45 UTC (391 KB). The access section provides links to "View PDF", "HTML (experimental)", and "TeX Source". It also includes a Creative Commons Attribution (CC BY) license link and a "view license" option. The current browse context is cs.CV, with navigation links for "prev", "next", "new", "recent", and "2024-07". A "Change to browse by: cs" link is also present.



Code & knowledge sources

Knowledge: Blogs

The Tensor

The Loss Function

The Autograd

The nn Module

The Autograd

How PyTorch lets you build and experiment with a neural net

We show an example of building a classifier neural network in PyTorch and highlight how easy it is to experiment with advanced ideas.

Tirthajyoti Sarkar in Towards Data Science
Nov 27 · 10 min read ★

LATEST

Sound classification using Images

Learn how to classify audio files using spectrograms

Dipam Vasani in Towards Data Science
May 14 · 5 min read ★

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Teaching the learners.

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Machine Learning Basics with the K-Nearest Neighbors Algorithm
9 min read

<https://medium.com/topic/artificial-intelligence>
<https://medium.com/topic/machine-learning>

Real-time Object Detection with YOLO, YOLOv2 and now YOLOv3

Jonathan Hui [Follow](#)
Mar 18, 2018 · 18 min read

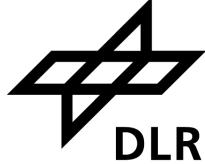


You only look once (YOLO) is an object detection system targeted for real-time processing. We will introduce YOLO, YOLOv2 and YOLO9000 in this article. For those only interested in YOLOv3, please forward to the bottom of the article. Here is the accuracy and speed comparison provided by the YOLO web site.

Model	Train	Test	mAP	FLOPS	FPS
SSD300	COCO trainval	test-dev	41.2	-	46
SSD500	COCO trainval	test-dev	46.5	-	19
YOLOv2 608x608	COCO trainval	test-dev	48.1	62.94 Bn	40
Tiny YOLO	COCO trainval	-	-	7.07 Bn	200
SSD321	COCO trainval	test-dev	45.4	-	16
DSSD321	COCO trainval	test-dev	46.1	-	12
R-FCN	COCO trainval	test-dev	51.9	-	12
SSD513	COCO trainval	test-dev	50.4	-	8
DSSD513	COCO trainval	test-dev	53.3	-	6
FPN FRCN	COCO trainval	test-dev	59.1	-	6
Retinanet 50_500	COCO trainval	test-dev	50.0	-	14

Code & knowledge sources

Code: Conferences (selection)

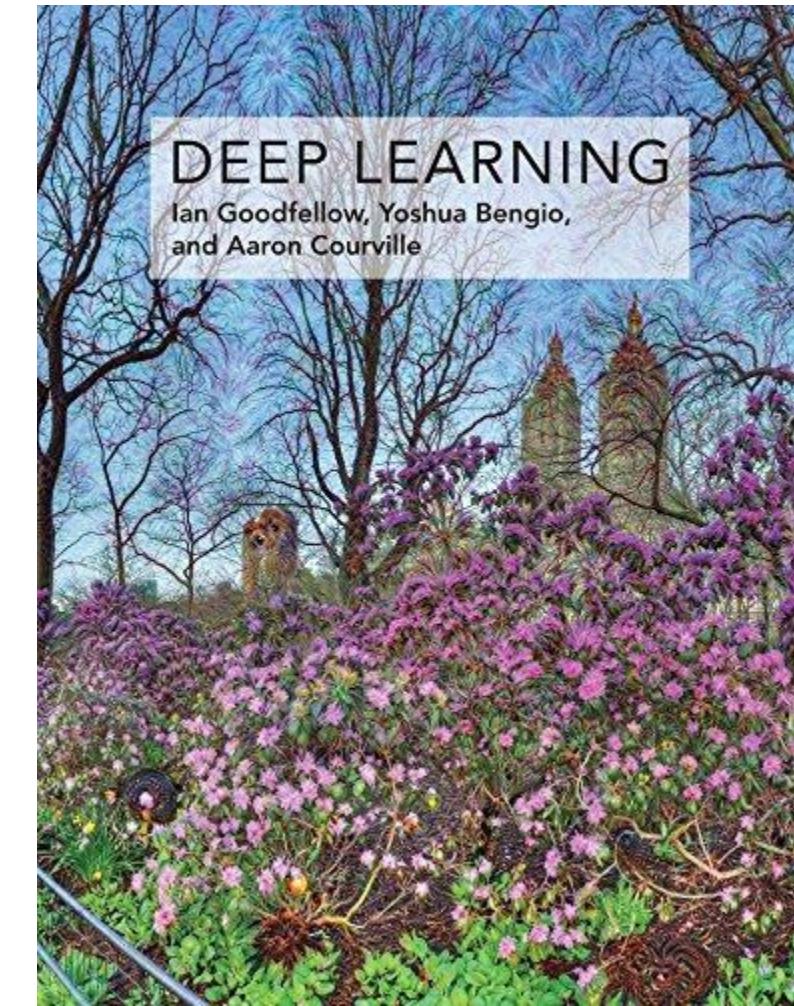
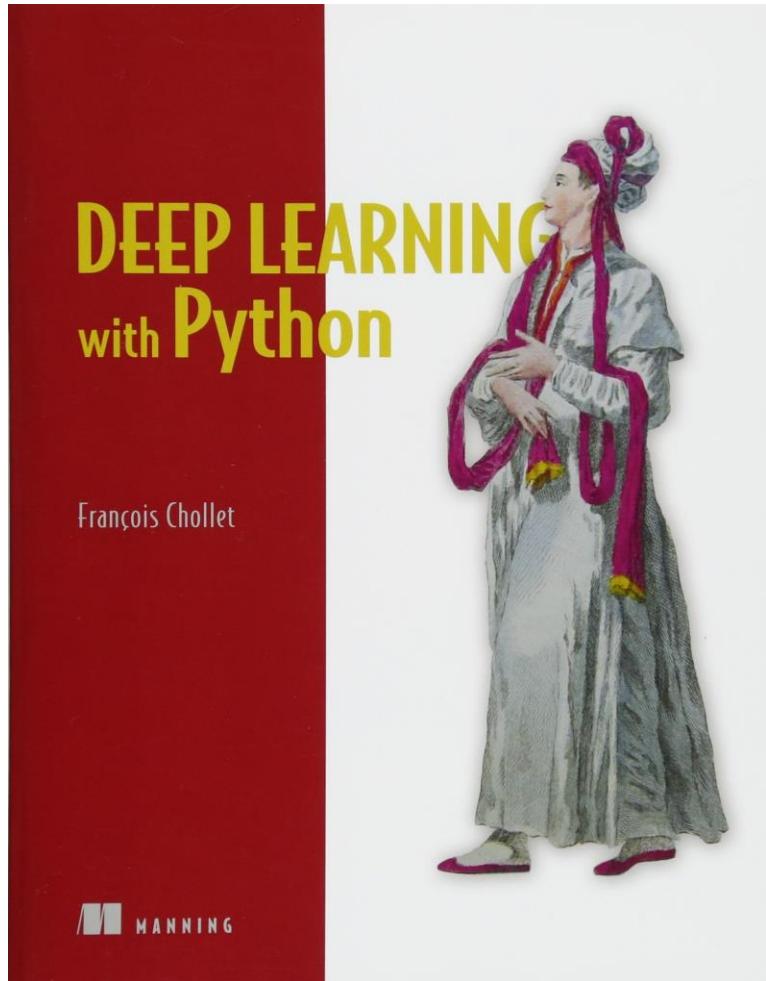
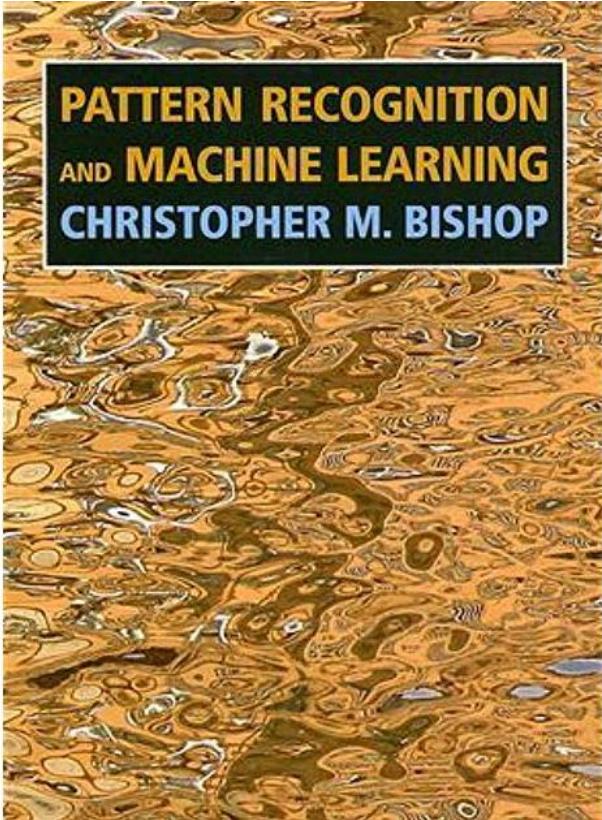


...and of course
many domain-
specific conferences



Code & knowledge sources

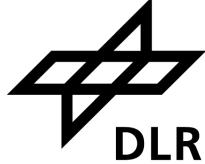
Knowledge: Books



<http://www.deeplearningbook.org/>

Code & knowledge sources

Knowledge: Online Courses



Browse > Data Science > Machine Learning

Machine Learning

★★★★★ 4.9 120,193 ratings • 29,510 reviews

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Machine learning is the science of getting computers to act without being explicitly programmed. In the past decade, machine learning has given us self-driving cars, practical speech recognition, effective web search, and a vastly improved understanding of the human genome. Machine learning is so pervasive today that you probably use it dozens of times a day without knowing it. Many researchers also think it is the best way to make

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A.Fitri, S.Vemuri, S.Naveenachandran, DLR-DW, 13.-14.11.2025

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Set and maintain flexible deadlines.



Intermediate Level



Approx. 3 months to complete

Suggested 11 hours/week

Thank you for your participation!



Auliya Fitri, Sai Vemuri, Sreerag Naveenachandran
Machine Learning Group
Institute of Data Science

Imprint



Topic: **Introduction to Deep Learning**
Part V – Code and Knowledge Sources

Date: 2025-11-14

Author: Auliya Fitri, Sai Vemuri, Sreerag Naveenachandran

Institute: Data Science

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