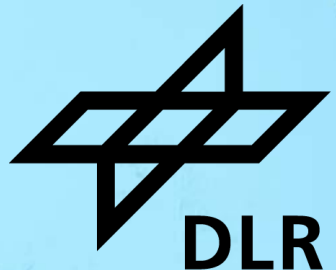


# **INTRODUCTION TO DEEP LEARNING**

## **PART V – CODE AND KNOWLEDGE SOURCES**

**Auliya Fitri, Sai Vemuri, Sreerag Naveenachandran**

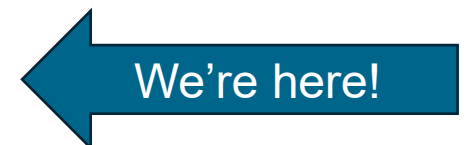
**Machine Learning Group  
Institute of Data Science**



# Schedule



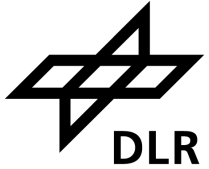
Date	Time	Activity
13.11.2025 Day 1	09:00 - 10:00	Introduction and basics
	10:00 - 10:30	Hands-on I
	10:30 - 10:45	Coffee break
	10:45 - 11:45	Advanced concept and Convolutional Neural Network
	11:45 - 12:15	Hands-on II
	12:15 - 12:30	Recap Day 1
14.11.2025 Day 2	09:00 - 10:00	Deep Generative Model
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



# 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



The screenshot shows the GitHub repository page for 'ultralytics/yolov5'. The browser address bar displays 'https://github.com/ultralytics/yolov5'. The repository's navigation bar includes links for 'README', 'Code of conduct', 'Contributing', 'AGPL-3.0 license', and 'Security'. The 'Documentation' section is active, providing instructions on how to install and use YOLOv5. It includes a code block for cloning the repository and installing dependencies, and another code block for performing inference using PyTorch Hub. The page also mentions that models are automatically downloaded from the latest YOLOv5 release.

```
# 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
```

```
import torch

# Load a YOLOv5 model (options: yolov5n, yolov5s, yolov5m, yolov5l, yolov5x) # Default is yolov5s
model = torch.hub.load("ultralytics/yolov5", "yolov5s")

# Define the input image source (URL, local file, PIL image, etc.) # Example
img = "https://ultralytics.com/images/zidane.jpg"

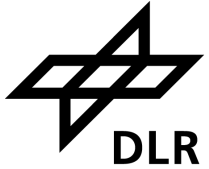
# Perform inference (handles batching, resizing, normalization)
results = model(img)

# Process the results (options: .print(), .show(), .save(), etc.)
results.print() # Print results to console
results.show() # Display results in a window
results.save() # Save results to runs/detect/exp
```

# 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/>




A screenshot of a web browser displaying an arXiv paper page. The browser's address bar shows the URL 'https://arxiv.org/abs/2407.20892v1'. The page header includes the Cornell University logo and name. The paper title is 'What is YOLOv5: A deep look into the internal features of the popular object detector' by Rahima Khanam, Muhammad Hussain. It was submitted on 30 Jul 2024. The page offers two main options: 'View PDF' and 'HTML (experimental)'. A summary paragraph describes the study's focus on the YOLOv5 model's architecture and performance. Below this, it lists subjects as 'Computer Vision and Pattern Recognition (cs.CV)' and provides citation information. A 'Submission history' section shows the paper was submitted by Rahima Khanam on Tue, 30 Jul 2024 at 15:09:45 UTC. At the bottom, there are buttons for 'View PDF', 'HTML (experimental)', and 'TeX Source', along with a Creative Commons BY license icon and navigation links for previous/next papers and browsing by date.




# Code & knowledge sources


## Knowledge: Blogs




The Tensor



The Loss Function




The Autograd




The nn Module

### 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 ★

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<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	59.9	-	14

# Code & knowledge sources

## Code: Conferences (selection)



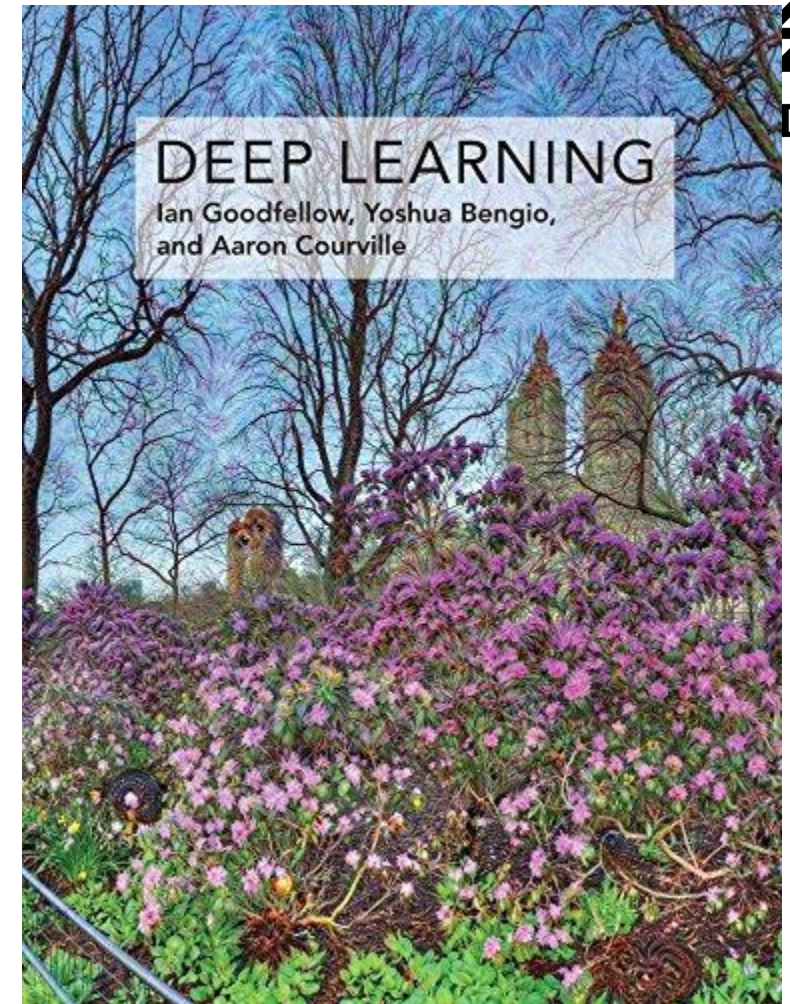
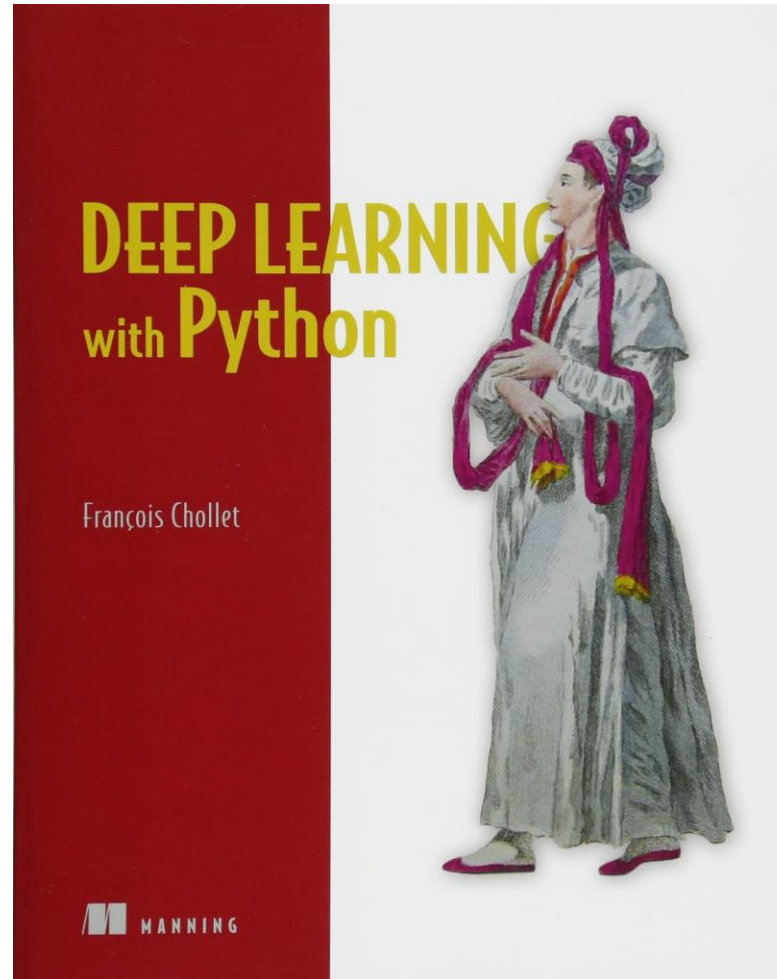
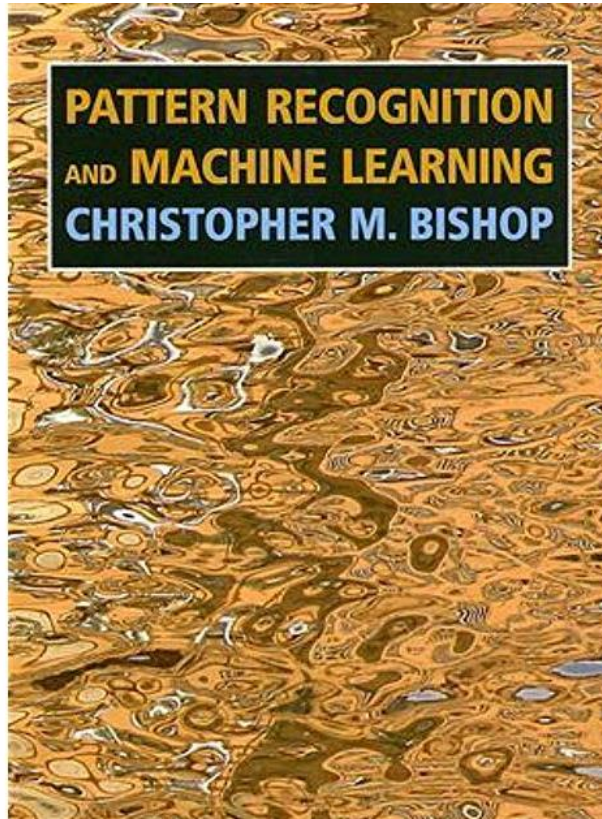
...and of course  
many domain-  
specific conferences





# Code & knowledge sources

## Knowledge: Books



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

# Code & knowledge sources

## Knowledge: Online Courses



Browse > Data Science > Machine Learning

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Machine Learning

<https://www.coursera.org/>

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

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#### 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**

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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