



Computer Vision

Autumn 2023

Yuriy Kochura

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[@y_kochura](#)

Instructor

Lectures and practices :

- **Yuriy P. Kochura**
 - Department of Computer Engineering, FICS



Course Description

This course will introduce you to deep learning approaches that are used in cutting-edge research in computer vision and provide practical experience:

- Using of neural networks (fully connected and convolutional layers, forward and backward propagation, activation functions, ...)
- Training of neural networks (initialization, optimization, regularization, model choice, ...)

Course Learning Outcomes

1. Identify problems where computer vision techniques are applicable.
2. Apply CV techniques for some classical problems.

Prerequisites

1. **Mathematics:** Knowledge of and ability to use calculus, analytical geometry, linear algebra and probability theory.
2. **Programming:** Ability to program in Python.

Classroom

This semester the course takes place online (virtual in-class lectures) on **BigBlueButton** at <https://bbb.comsys.kpi.ua/b/yur-spb-qnl-jqk>

The screenshot displays the BigBlueButton interface. On the left, a sidebar contains sections for MESSAGES (Public Chat), NOTES (Shared Notes), USER MANAGEMENT (Waiting Users), and USERS (1) (Yury Kochura (You)). The main area shows a 'Public Chat' window with a welcome message: 'Welcome to Computer Vision' and instructions on how to use the system. Below this, a grid of interactive tools is presented, including CHAT, WEBCAMS, AUDIO, BREAKOUT ROOMS, POLLING, EMOJIS, SCREEN SHARING, and MULTI-USER WHITEBOARD. At the bottom, a navigation bar shows 'Slide 1' and various controls for the presentation.

MESSAGES

Public Chat

NOTES

Shared Notes

USER MANAGEMENT

Waiting Users

USERS (1)

Yury Kochura (You)

Public Chat

Welcome to Computer Vision

For help on using BigBlueButton see these (short) [tutorial videos](#).

To join the audio bridge click the speaker button. Use a headset to avoid causing background noise for others.

This server is running BigBlueButton.

To invite someone to the meeting, send them this link:
<https://bbb.comsys.kpi.ua/b/yur-spb-qnl-jqk>

Computer Vision

Start recording

You have joined the audio conference

Welcome To BigBlueButton

BigBlueButton is an open source web conferencing system designed for online learning

CHAT

Send public and private messages.

WEBCAMS

Hold visual meetings.

AUDIO

Communicate using high quality audio.

BREAKOUT ROOMS

Form teams of users for group work.

POLLING

Poll your users anytime.

EMOJIS

Express yourself.

SCREEN SHARING

Share your screen.

MULTI-USER WHITEBOARD

Draw together.

For more information visit bigbluebutton.org →

Slide 1

100%

Message Public Chat

Course hub

All important information about the course will be available on the course web page
<https://courses-cs-kpi.github.io/cv-23fall/>

- Slides and materials
- Homeworks

The screenshot shows a web page for the 'Computer Vision' course. The page has a dark theme with a sidebar on the left containing 'Home' and 'About' links. The main content area features the course title 'Computer Vision' and the instructor's name 'Igor Sikorsky Kyiv Polytechnic Institute, Autumn 2023'. Below this is a profile picture of Yuriy P. Kochura, his email 'iuriy.kochura@gmail.com', and his affiliation 'Department of Computer Engineering, FICS'. A 'When:' section states 'every Tue at 12:20 PM by Kyiv time' and a 'BBB Link' button is provided. The course description states: 'This course will introduce you to deep learning approaches that are used in cutting-edge research in computer vision (CV) and provide practical experience:'. Two numbered points follow: '1 Using of neural networks (fully connected and convolutional layers, forward and backward propagation, activation functions, ...)' and '2 Training of neural networks (initialization, optimization, regularization, model choice, ...)'. Below this is a 'Course Learning Outcomes' section with two bullet points: 'Identify problems where computer vision techniques are applicable.' and 'Apply CV techniques for some classical problems.' A 'More...' link is present. At the bottom, there is an 'Intro' section with a date '19 Sep:' and buttons for 'OVERVIEW', 'Details', '[HML]', and '[PDF]'. The footer contains the text 'This site uses Just the Docs, a documentation theme for Jekyll.' and 'Yuriy Kochura © 2023 CC BY-NC-SA 4.0'.


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About

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Computer Vision

Igor Sikorsky Kyiv Polytechnic Institute, Autumn 2023

 **Yuriy P. Kochura** LECTURES/PRACTICES
iuriy.kochura@gmail.com
Department of Computer Engineering, FICS
When: every Tue at 12:20 PM by Kyiv time
[BBB Link](#)

This course will introduce you to deep learning approaches that are used in cutting-edge research in computer vision (CV) and provide practical experience:

- 1 Using of neural networks (fully connected and convolutional layers, forward and backward propagation, activation functions, ...)
- 2 Training of neural networks (initialization, optimization, regularization, model choice, ...)

Course Learning Outcomes

- Identify problems where computer vision techniques are applicable.
- Apply CV techniques for some classical problems.

[More...](#)

Intro

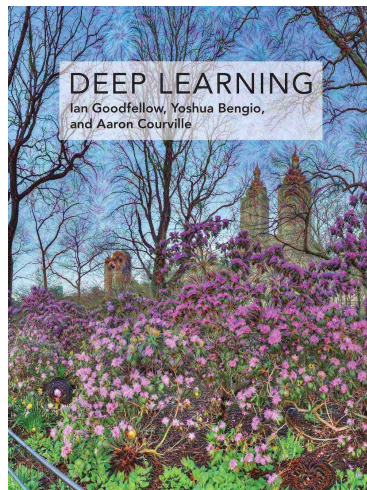
19 Sep: [OVERVIEW](#) [Details](#) 📄 [\[HML\]](#) [\[PDF\]](#)

This site uses [Just the Docs](#), a documentation theme for Jekyll.

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Textbooks

There is no required textbook for this class, but I would like to recommend some books for a more comprehensive introduction with advanced topics in deep learning and computer vision or get another perspective on the lecture material:



Free

Neural Networks and Deep Learning

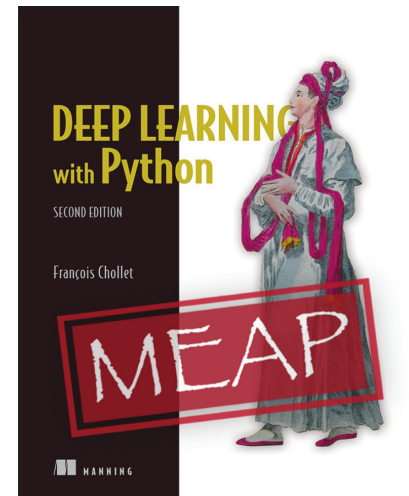
Neural Networks and Deep Learning is a free online book. The book will teach you about:

- Neural networks, a beautiful biologically-inspired programming paradigm which enables a computer to learn from observational data
- Deep learning, a powerful set of techniques for learning in neural networks

Neural networks and deep learning currently provide the best solutions to many problems in image recognition, speech recognition, and natural language processing. This book will teach you many of the core concepts behind neural networks and deep learning.

For more details about the approach taken in the book, [see here](#). Or you can jump directly to [Chapter 1](#) and get started.

Free

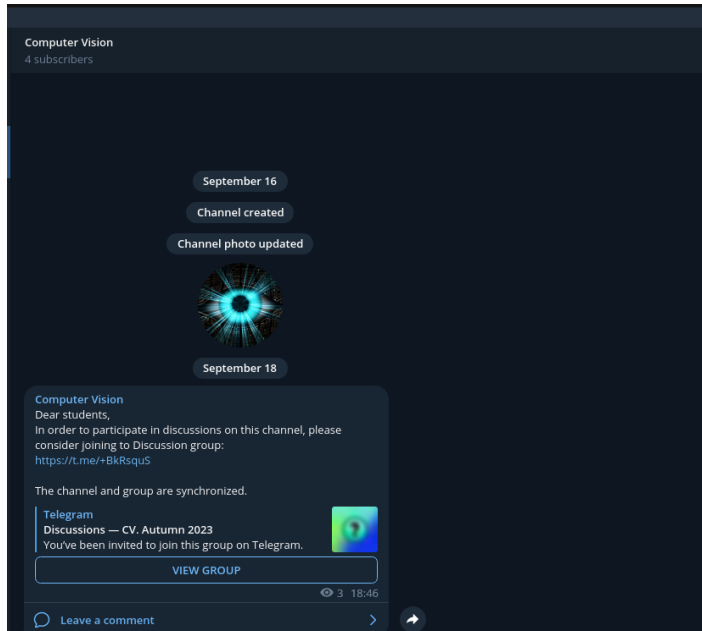


Freely previewing

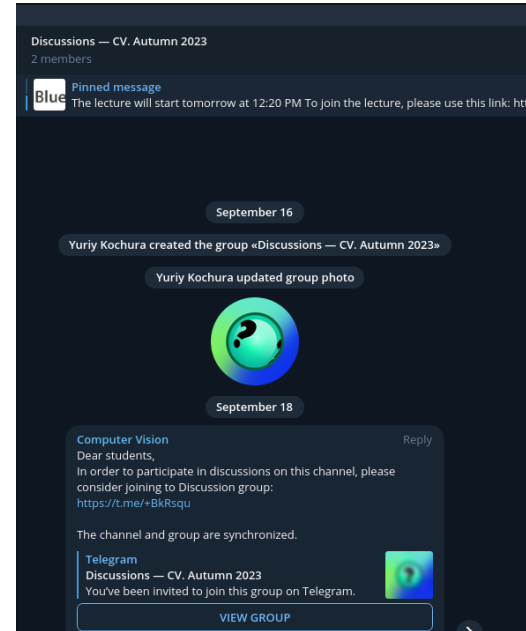
Announcements & Discussions

All **announcements** and **discussions** will take place in Telegram (let me know if you need to be added)

- Discuss materials and ask your questions offline in the group.
- Don't be shy!



Announcement



Discussions

Assignments

Exercises to get you started with deep learning techniques for computer vision tasks.

Grading

- 60% Programming assignments (15% each)
- 40% Graded test

Note! The requisition of admission to semester control (Graded test) is

Programming assignments $\geq 36\%$

Let's start!