



## Department of Electrical and Computer Engineering

Summer Course 2025

*Intelligent Systems Lab, ENCS5141*

### Case Study #2: Experimenting with transfer learning

In this case study, you will apply transfer learning with two popular networks **AlexNet** and **VGG16** to classify images on CIFAR10 dataset. Starting with weights obtained by pre-training the networks on the imagenet dataset (see Exp. 8), apply transfer learning by training on the CIFAR10 for **3 epochs** with **batch size 32**. For each model you need to test the following setups:

1. **Finetuning**: this is the same setup as we did in experiment 8, where the goal is to update all the pretrained weights besides the newly added classification layer.
2. **ConvNet as fixed feature extractor** Here, we freeze the weights for all of the network except that of the final fully connected layer. This last fully connected layer is replaced with a new one with random weights and only this layer is trained.

(*hint*: see the “ConvNet as fixed feature extractor” section in [Pytorch Tutorials](#).)

Compare the accuracy of the two models on the test set of CIFAR10 dataset using the two setups mentioned above. Comment on your results and discuss any insights gained from comparing the two setups.

#### Submissions:

- You need to submit the code in .ipynb format. You can obtain this file in Google Colab by navigating to the File menu and selecting Download > Download .ipynb.
- **Do not submit a report.** Only add a text cell at the end of your notebook to discuss your results.

#### Important notes:

- Make sure to add descriptive comments and headings using markup language, such as Markdown, in your Google Colab notebook or Jupiter notebook.
- **Deadline: Thursday, 14 August 2025** at 11:59 pm. Please submit your case study solution through Ritaj as a reply to this message.
- **Late Submission Policy:** One mark (out of the 30 marks assigned to case studies in the course outline) will be deducted for every day of late submission of the case study. No submissions will be accepted beyond the third day past the due date.