Assignment 5: Image Classification with CNNs

Exercise: Custom Image Classification Project (12 points)

Work in groups of 2-3 people:
Its time to use the toolset we have built over the last few weeks on a problem of your own choosing!
Pick an image dataset that interests you from sources like Kaggle or TensorFlow Datasets. Avoid toy datasets like MNIST or CIFAR-10.
Train and compare at least two different pretrained models using transfer learning and one custom CNN architecture you design from scratch (or that is a more complex adaptation of the pretrained model).

Document your preprocessing pipeline, data augmentation strategies, and hyperparameter choices with clear reasoning. (Argue why you did or did not do certain steps!)

Finally, compare model performance and training behavior. Use suitable metrics, a confusion matrix and optionally GradCAM to visualize and interpret what your models learned, analyzing both correct and incorrect predictions.

Submission

Submit a Jupyter notebook via Moodle with clear explanations, code, and visualizations. Note any use of LLMs.

Total Points: 12