**Summer school**

AI made

**Basic Session on Convolutional Neural Networks**

# Introduction

Explanation of what Convolutional Neural Networks (CNNs) are and their importance in the field of computer vision

Discuss the basics of image processing and how it relates to CNNs

# Layers of a CNN

Input layer

Convolutional layer

Activation layer

Pooling layer

Fully connected layer

Output layer

# Convolutional Layer

Explanation of how the convolutional layer works and its role in CNNs

Understanding of filters and their impact on feature extraction

Demonstration of how filters can be applied to an image

# Activation Layer

Explanation of how activation functions work and their importance in CNNs Introduction to common activation functions such as ReLU, Sigmoid, and

Tanh

Demonstration of how activation functions can be applied to the output of a convolutional layer

# Pooling Layer

Explanation of how the pooling layer works and its role in CNNs

Understanding of different types of pooling such as max pooling and average pooling

Demonstration of how pooling can be applied to the output of an activation layer

# Fully Connected Layer

Explanation of how the fully connected layer works and its role in CNNs

Understanding of how the fully connected layer is used for classification

Demonstration of how the output of a pooling layer can be flattened and passed through a fully connected layer

# Conclusion

Recap of the different layers of a CNN and how they work together

Discussion on the importance of CNNs in the field of computer vision and their practical applications

# Not AI made

Intro - 10 minutes

What are CNNs used for? Why?

Why not ANNs?

Basics - 10-15 minutes

What is the convolution operator?

Padding

Why we don’t backpropagate to find operator when someone else already did.

Some examples (Sobel), quick quiz – 5-10 minutes

Activation functions – 5 minutes

Pooling – 10 minutes

Flattening

Fully connected layers - 5

Quiz - 5

Gradient and histogram stuff?? Qualitatively? – 20 – 30 minutes

Skipped connections? – 10-20