MANAKULA VINAYAGAR INSTITUTE OF TECHNOLOGY

Approved by AICTE, New Delhi and Affiliated to Pondicherry University

Accredited by NBA & NAAC 'A' Grade

Kalitheerthalkuppam, Puducherry - 605107

JASPER

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Educate **Empower** **Excel**

MAGAZINE 2023-24

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

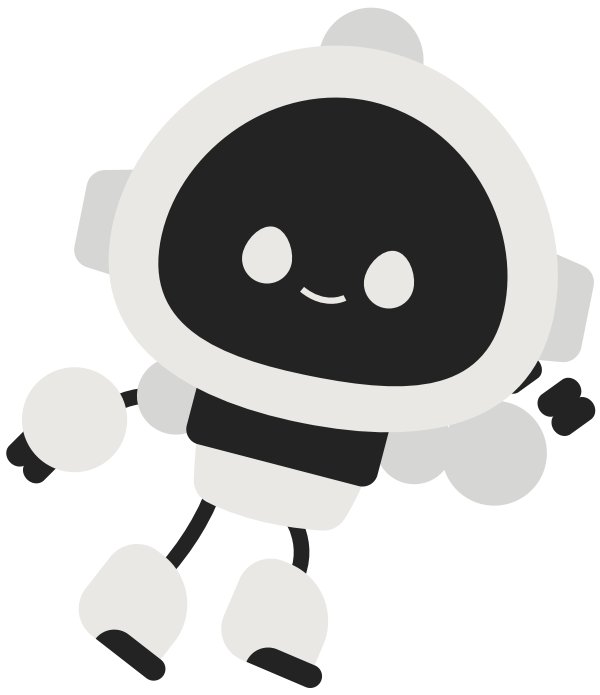
Unlocking the Future with Intelligent Innovation.

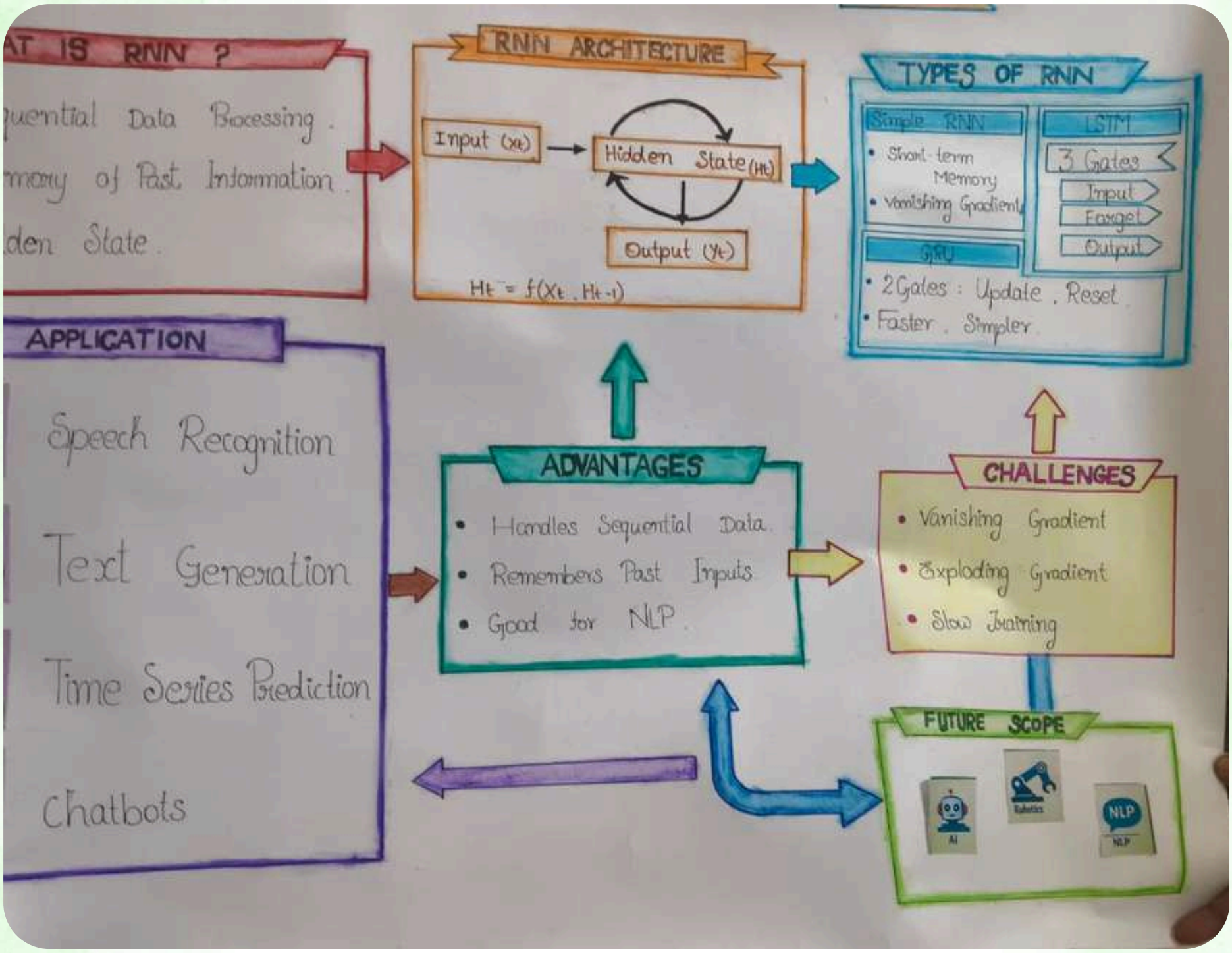
ABOUT THE DEPARTMENT

The Department was started with an intake of 60 students in 2021; the sanctioned intake was increased to 120 seats in 2022 and 180 seats in 2024. The Department of Artificial Intelligence and Machine Learning has been continuously making progress in Teaching and R & D activities. The Department focuses on preparing the students for wide range of IT careers equipping them with unique enriching experience of molding tomorrow's technocrats with high caliber and commitment

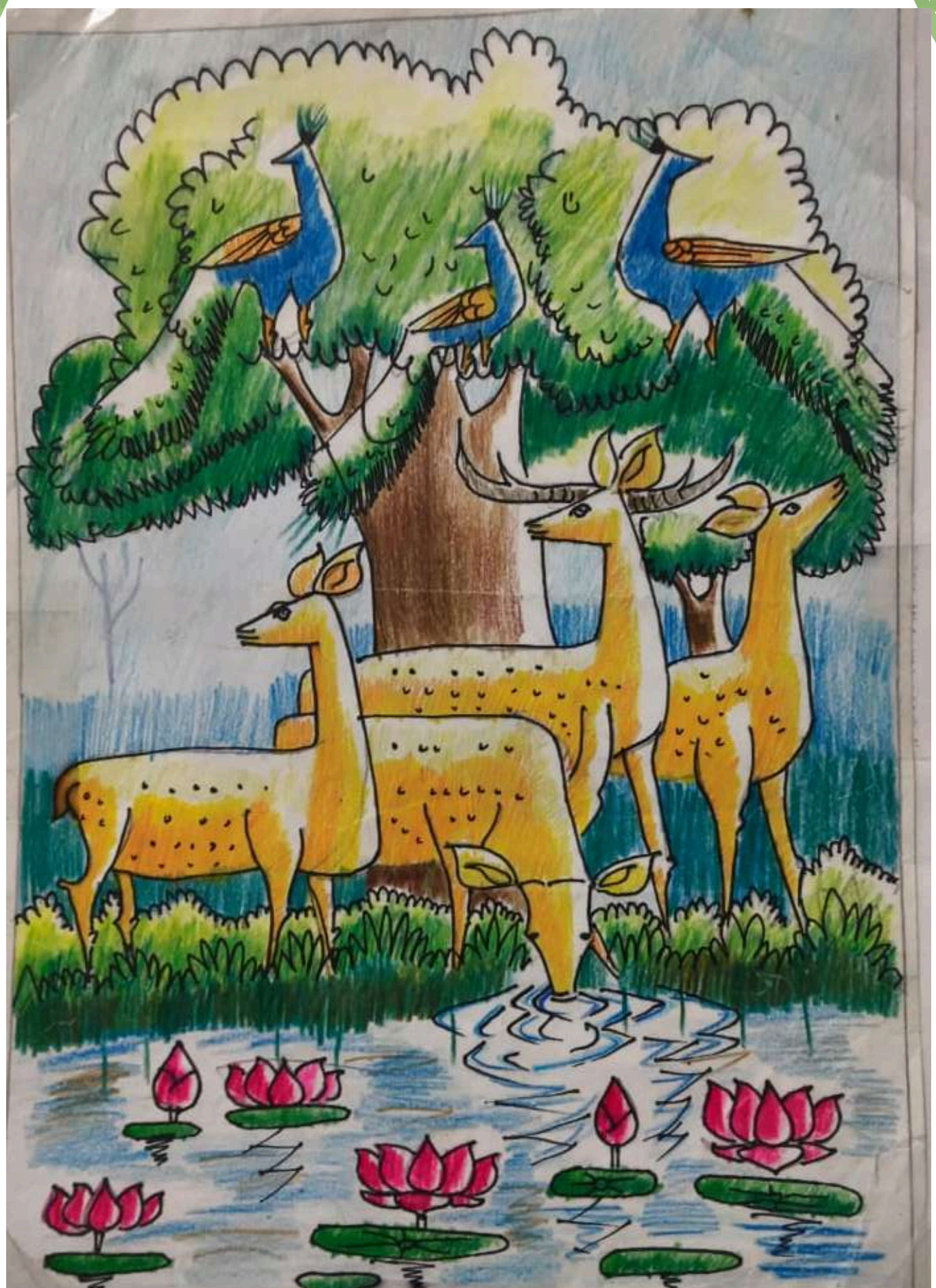
The Department is well equipped with 180 Computer Systems with latest configuration and also has a separate Department Library with Latest Titles, Editions, Journals, and Magazines and also connected with Internet Facility. The Department organizes Seminars, Workshops and Guest lecturers to enhance the Technical Skills of the students, so that they can face global competition.

The Department has entered into MoU with Twight IT Solutions, Pondicherry, Top skilled academy Pondicherry and GeePlex for software training and Faculty Development Programs, besides R&D activities





JANANI FROM 2ND YEAR B SEC



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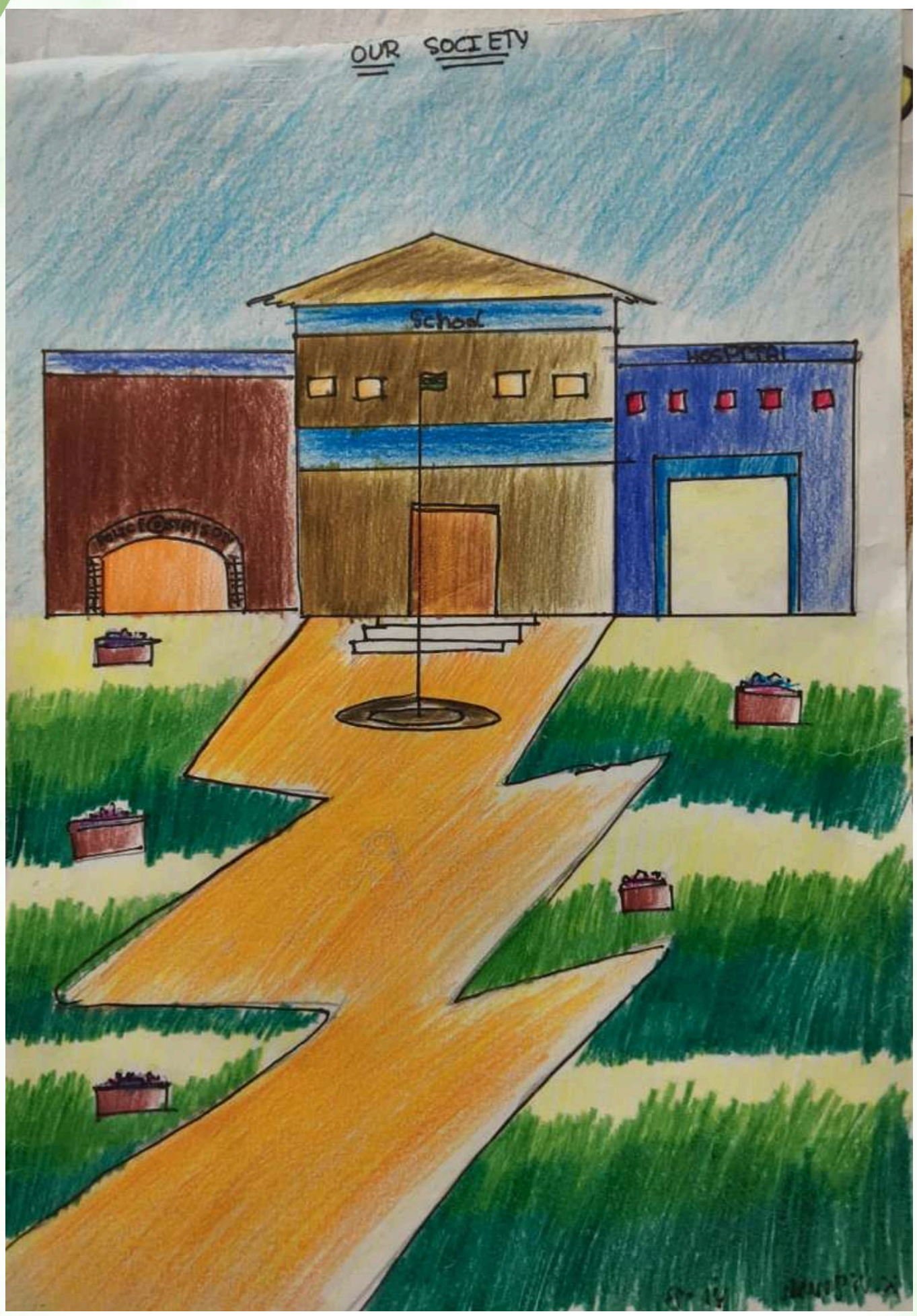

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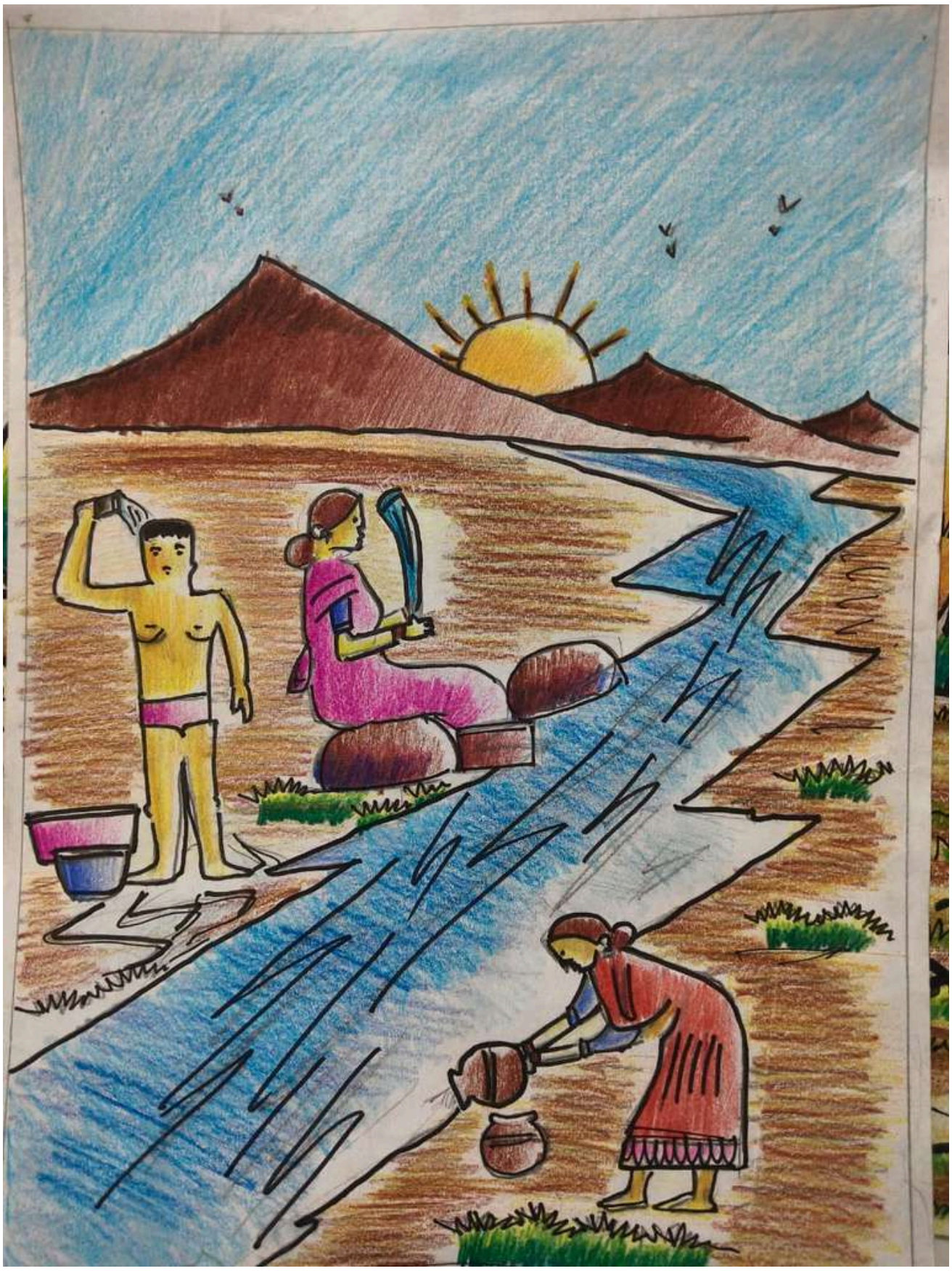


VIGNESH K FROM 2ND YEAR B SEC

Understanding Convolutional Neural Network

Key Concepts...

CONVOLUTIONAL LAYER...

Applies filters to detect features like edges, textures and patterns

3×3 filters

Pooling Layer

Downsamples the image by reducing dimensionality, selecting the maximum value from each region.

2×2 Max pooling

Flattening Layer

FULLY CONNECTED LAYER

Flattens features maps into a vector which is fed into a fully connected layer like a traditional neural network.

Applications

IMAGE CLASSIFICATION

Identify and categorize objects within images into predifined classes.

Eg., Recognizing a cat

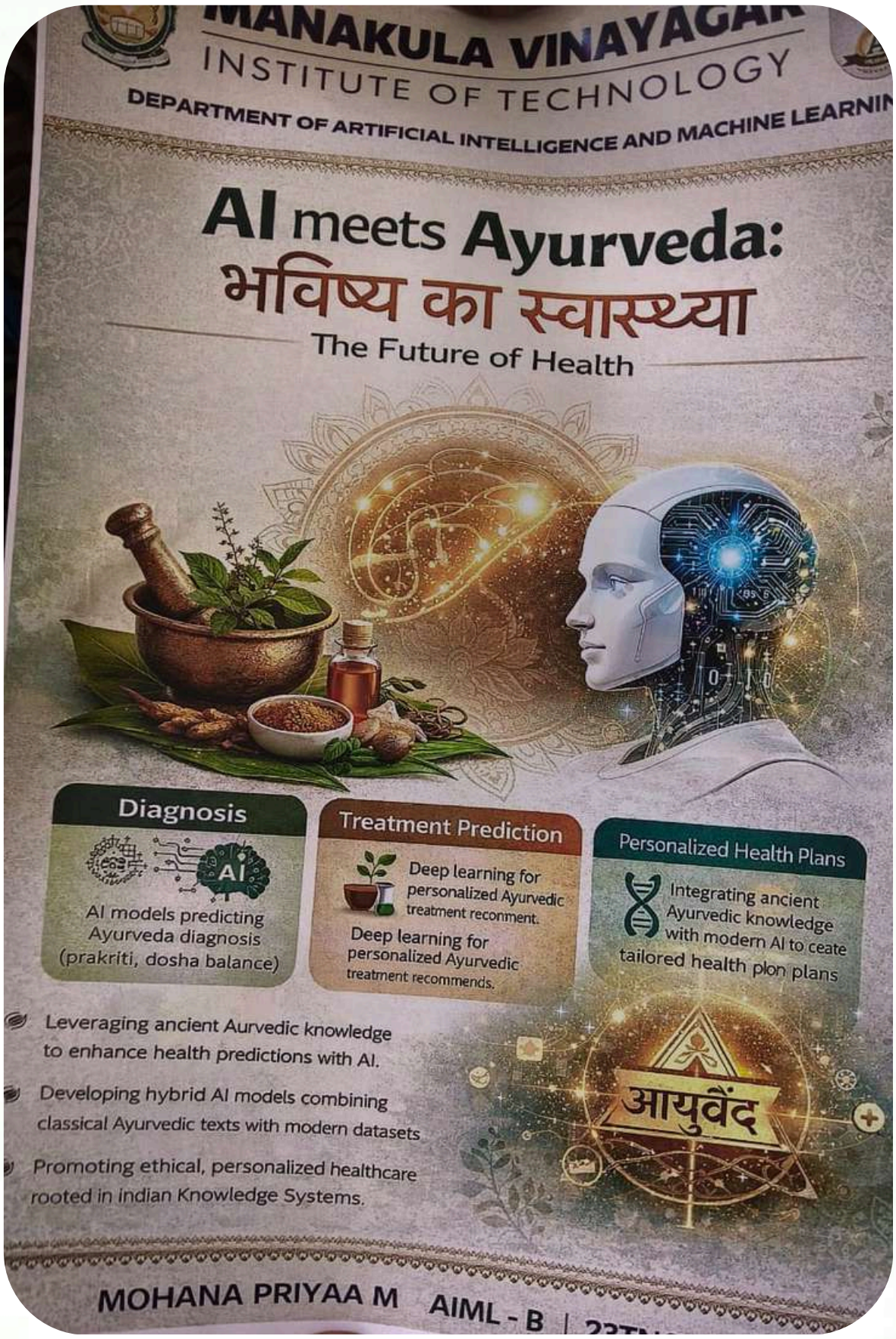
Image Segmentation

IMAGE SEGMENTATION

Partition an image into regions to identify and segment objects such as roads, cars and pedestrians.

KIRUTHIKA FROM 2ND YEAR B SEC

VIGNESH K FROM 2ND YEAR B SEC



MOHANA PRIYAA FROM 2ND YEAR B SEC

MANAKULA VINAYAGAR INSTITUTE OF TECHNOLOGY

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

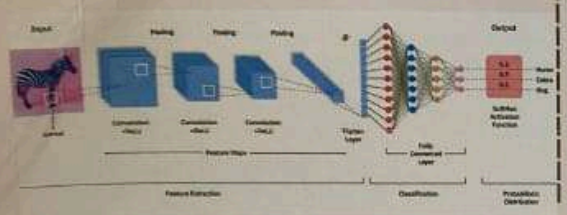
CONVOLUTIONAL NEURAL NETWORK (CNN)

INTRODUCTION:

A Convolutional Neural Network (CNN) is a type of deep learning model mainly used for image processing and computer vision tasks.

It automatically detects important features like edges, shapes, and patterns from images.

CNN ARCHITECTURE :

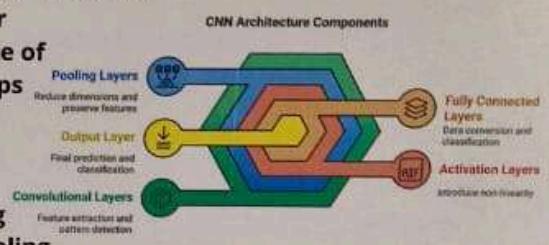


KEY COMPONENTS

Convolution Layer
- Applies filters (kernels) to input image
- Extracts features like edges, textures
- Produces feature maps

Activation Function (ReLU)
- Adds non-linearity
- Formula: f(x) = max(0, x)

Pooling Layer
- Reduces size of feature maps

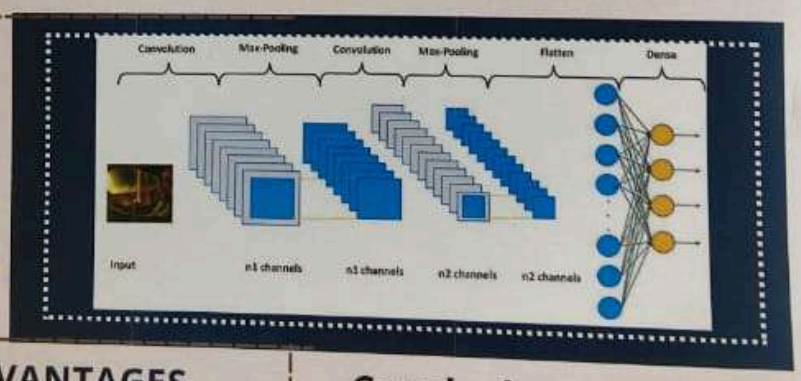


Types:
- Max Pooling
- Average Pooling

Fully Connected Layer
- Final layer for classification
- Converts features into output classes

WORKING PROCESS:

- Input Image
- Convolution → Feature Extraction
- Activation (ReLU)
- Pooling → Dimension Reduction
- Flattening
- Fully Connected Layer
- Output (Prediction)



APPLICATION:

Face Recognition
Self-driving Cars
Medical Image Analysis
Image Classification
Video Analysis

ADVANTAGES

- Automatic feature extraction
- High accuracy in image tasks
- Reduces manual work
- Efficient for large datasets

EXAMPLE

INPUT: CAT IMAGE
OUTPUT: "CAT" (CORRECT CLASSIFICATION)

Conclusion

CNNs are powerful deep learning models widely used in image and vision-based applications. They play a major role in modern AI systems.

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