

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF INFORMATION TECHNOLOGY

A brief report of Online FDP on "AI and Generative AI in Computer Vision and Image Processing from Concepts to Applications"

FDP Dates: 02nd -12th June, 2025

Day	Date	Resource Person	Topic	Report
1	02/06/2025	Dr. Md. Farukh Hashmi, NIT Warangal	Talk-1:"Research in Machine Learning"	A detailed overview of the evolution of machine learning research, including classical ML foundations and modern trends like deep learning and generative models. The session emphasized research challenges, dataset limitations, and strategies for impactful scholarly contributions.
		Prof. K. M. Bhurchandi, NIT Warangal	Talk-2: "Deep Concepts of Deep Learning"	Covered fundamental and advanced deep learning principles, focusing on neural architectures, optimization strategies, activation functions, and the role of representation learning. Participants gained clarity on how deep models learn hierarchical abstractions.
2	03/06/2025	Dr. Md. Farukh Hashmi, NIT Warangal	Talk-1:"Generative AI and its application for healthcare"	Explored diffusion models, GANs, and LLM-based medical applications. Real-world healthcare use cases such as MRI reconstruction, disease prediction, and synthetic data generation were demonstrated.
			Talk-2: "Fundamental of python Programming and Platform for Deep Learning and Machine learning implementation"	
3	04/06/2025	Dr. Tripti Goel, NIT Silchar	Talk-1: Topic: " Role of Diffusion-Weighted Imaging & Susceptibility-Weighted Imaging in Predicting Hemorrhage Progression in Stroke Patients.	The session explained the significance of diffusion- and susceptibility-weighted imaging in stroke prognosis. Clinical datasets, lesion progression biomarkers, and classification techniques were discussed.
		Dr. Vijay Bhaskar Semwal MANIT Bhopal	Talk-2: Topic: "LLMs in human AI collaboration and co creations: Harnessing power of generative AI"	Focused on the synergy between human creativity and large language models. Demonstrated how LLMs assist in ideation, automation, and co-creation, along with emerging applications in generative design.

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4	05/06/2025	Dr. Ghanapriya Singh, NIT Kurukshetra	Talk-1: Topic: " Deep Fake Technology: Foundations, Ethics and Detection Strategies"	Explained deepfake generation pipelines, threat models, and forensic detection strategies. Participants learned about GAN-based synthesis and defense mechanisms such as frequency analysis and anomaly detection.
		Dr. Md. Farukh Hashmi, NIT Warangal	Talk-2: Topic: "Image classification using Deep learning, data augmentation - Hands on Session	A hands-on session demonstrating CNN-based classification, augmentation techniques, and performance improvement methods. Participants implemented models using standard datasets.
5	06/06/2025	Dr. Singh Sandeep Sengar, Cardiff Metropolitan University UK	Talk-1: Topic: " Vision Transformer: A New Paradigm in Computer Vision"	Provided an in-depth understanding of ViT architecture, patch embeddings, self-attention mechanisms, and transformer superiority over CNNs for large-scale vision tasks. Case studies included medical image segmentation and object recognition.
6	07/06/2025	Dr. Konda Reddy IIT Hyderabad	Talk-1: Topic: "Auto encoders & Representation"	Explained encoder–decoder architectures, latent representations, and dimensionality reduction. Covered denoising and variational autoencoders with practical examples.
			Talk-2: Topic: "Auto encoders & Representation - Hands on session"	Focused on hands on session of AE and VAE models, visualized latent spaces, and performed reconstruction and anomaly detection tasks.
7	09/06/2025	Dr. Santosh Kumar IIT Ropar	Talk-1: Topic: "Deep learning based on different Architectures and Its Applications"	Discussed CNNs, RNNs, GANs, and hybrid architectures. Application domains included medical imaging, NLP, autonomous systems, and surveillance.
			Talk-2: Topic: "Data Augmentation and Transfer learning for computer vision applications- Hands on Session "	Participants trained ResNet, VGG, and MobileNet models using transfer learning. Practical augmentation strategies for small datasets were demonstrated.

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Day	Date	Resource Person	Topic	Report
8	10/06/2025	Dr. ILAIAH KAVATI, NIT Warangal	Talk-1: Topic: "Support Systems for Autonomous Vehicles using Deep Learning"	Introduced perception modules, lane detection, object tracking, and deep-learning-based safety systems used in autonomous driving.
		Dr. Aaditya Gupta, Agder University Norway	Talk-2: Topic: "Advanced Machine Learning algorithms for Aquacultur Applications"	Explored AI solutions for fish behavior analysis, water quality prediction, and yield optimization. Demonstrated ML workflows for real-world aquaculture datasets.
9	11/06/2025	Prof. Jaidhar C D, NIT Karnataka, Surathkal	Talk-1: Topic: "Plant Leaf Disease Detection Using Deep Learning"	Focused on CNN-based plant pathology detection, dataset preparation, lesion segmentation, and accuracy improvements using transfer learning.
			Talk-2: Topic: "Object Detection and Segmentation (like Yolo , UNET etc.) with Practical implementation "	A practical workshop where participants implemented YOLO for detection and U-Net for segmentation. Covered dataset annotation and evaluation metrics.
10	12/06/2025	Dr. Bhagyashree Lad, OZ Sports Nagpur	Talk-1: Topic: "Salient Object Detection and Case Study of AI based CV Applications"	Discussed saliency detection algorithms, benchmarks, and real-world AI applications like sports analytics and event broadcasting.
		Dr. Sambit Bakshi, NIT Rourkela	Talk-2: Topic: "The Rise and Rise of Biometrics Systems"	Provided insights into biometric security systems including face, iris, and fingerprint recognition. Covered modern deep-learning-enabled biometric pipelines, spoof detection, and ethical considerations. The session highlighted emerging trends such as multimodal biometrics and generative-model-driven security attacks.

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Aruna s (Presenting, annotating)

Online Faculty Development Programme on
Generative AI in Computer Vision and Image Processing from Concepts to Applications
Organized by
E&ICT Academy, NIT, Warangal
(Sponsored by Ministry of Electronics and Information Technology (MeitY), GOI)
(2nd JUNE – 12th JUNE 2025)
in association with
Department of Information Technology
VASAVI COLLEGE OF ENGINEERING (Autonomous)
ACCREDITED BY NAAC WITH A++ GRADE

10:52 AM | nun-dyss-qye

Farukh Hashmi Mohammad (Presenting, annotating)

People

All muted Add people

Search for people

IN THE MEETING

Contributors 66

ramesh kumar Ge... (You) Meeting host

A. Praveen Kumar

Abdul Khayum ECE

Abdul Khayum ECE

Abhinav Patel

Anil Kumar

1:13 PM | nun-dyss-qye

Farukh Hashmi Mohammad (Presenting, annotating)

GENERATIVE AI – TRANSFORMING THE FUTURE OF HEALTHCARE

- Revolutionizing Patient Care
 - Personalized diagnostics, treatment planning, and drug discovery accelerated by AI-generated insights.
- Augmenting Clinical Intelligence
 - Empowering healthcare professionals with decision support, predictive analytics, and virtual simulations.
- Enhancing Medical Research
 - AI-generated data models and synthetic datasets fueling faster, cost-effective research and clinical trials.
- A Glimpse into the Future
 - As generative AI matures, its integration across healthcare will lead to smarter systems, healthier populations, and more human-centered care.

3:29 PM | nun-dyss-qye

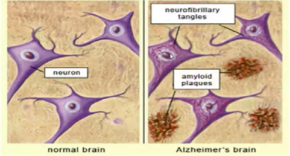
Farukh Hashmi Mohammad (Presenting, annotating)

GENERATIVE AI IN HEALTHCARE

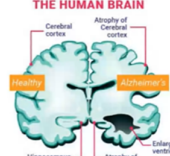
3:17 PM | nun-dyss-qye

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CHANGES AT CELLULAR AND NEUROLOGICAL LEVEL



normal brain Alzheimer's brain



THE HUMAN BRAIN

Fig. Human brain, in two halves: healthy and Alzheimer's disease. Healthy neuron and neuron with amyloid plaques.
Adapted from http://www.interest-general.info/article.php?id_arti

Fig. Progress of AD from MCI to severe AD.
Adapted from: S. Al-Shoukry, T. H. Rassem and N. M. Makbol, "Alzheimer's Diseases Detection by Using Deep Learning Algorithms: A Mini-Review," in *IEEE Access*.

10:23 AM | nun-dyss-qye

LLMs in Human-AI Collaboration and Co-Creation: Harnessing power of generative AI

Exploring the Role of Large Language Models in Enhancing Creativity and Collaboration




Dr. Vijay Bhaskar Semwal
Assistant Professor
Department of C.S.E
NIT, Bhopal
Visiting Faculty (IIIT Bhopal)

Presented during 10 days training FDP on *AI and Generative AI in Computer Vision and Image Processing From Concepts to Applications* jointly organized by the Electronics & ICT Academy NIT Warangal, in Association with the Department of IT, Vasavi College of Engineering(Autonomous) Hyderabad (T.S.)

11:46 AM | nun-dyss-qye

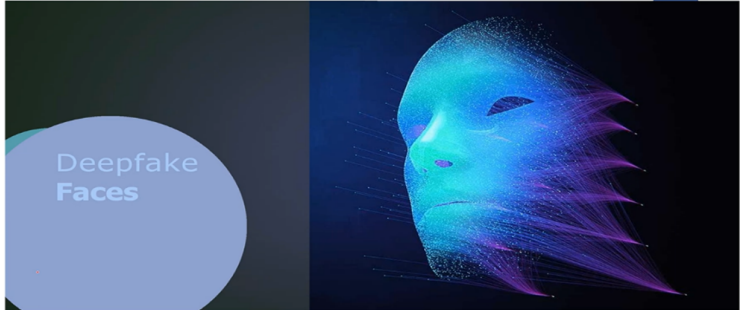
Introduction

Deepfake Information Trust Chart

Intention to mislead	Truth
I. Hoax Tampering of Evidence: Medical records, court cases, ... Scams & Fraud: Texting to impersonate, sending and receiving, generating artwork, ... Harming Credibility: Remying past, medical evidence via generated images or audio, ...	II. Propaganda Misdirection: Generated evidence to amplify events, ... Political Warfare: Tossing charge of actions, content, ... Compliance: Increased transparency, ...
III. Entertainment Altering Published Movies: Memes, comedy, satire, ... Editing & Special Effects: Generating scenes to remove, ... Art & Demonstration: Animating dead characters, generating portraits, technology demos, ...	IV. Trusted Authentic Content: Credible Multimedia "Data"

10:33 AM | nun-dyss-qye

Deepfake Faces



10:43 AM | nun-dyss-qye

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The Rise of Transformers

- Transformers, initially designed for NLP, excel at capturing long-range dependencies through self-attention mechanisms.
- Their ability to process input sequences holistically inspired researchers to adapt them for computer vision, leading to the creation of Vision Transformers.

Dr. Sandeep Singh Sengar

Attention Mechanism

- Self Attention**
 - To achieve self-attention, we feed the input into the encoder layer to create:
 - A query vector (**Q**)
 - A key vector (**K**)
 - A value vector (**V**)
 - These vectors are created from each input vector to the encoder
 - These vectors are trained and updated during the training process

Dr. Sandeep Singh Sengar

Autoencoder: Objective

- Let p be the data distribution in the input space, autoencoder is characterized with the following loss

$$\mathbb{E}_{p \sim p} \|x - g \circ f(x)\|^2 \approx 0$$
- Training: finding the parameters for the encoder ($f(\cdot; w_f)$) and decoder ($g(\cdot; w_g)$) optimizing the empirical loss

$$\hat{w}_f, \hat{w}_g = \underset{w_f, w_g}{\operatorname{argmin}} \frac{1}{N} \sum_n \|x_n - g(f(x_n; w_f); w_g)\|^2$$

Dr. Konda Reddy Mopuri

Denosing Autoencoder

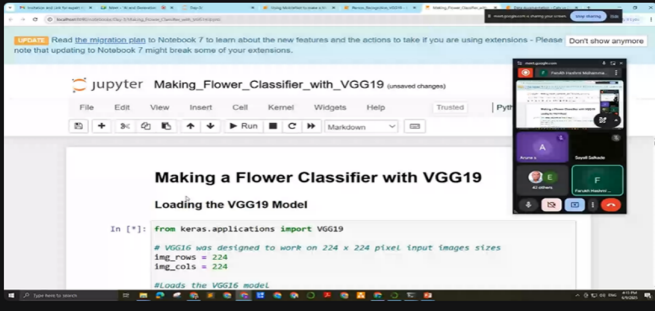
Imports and setup

```

import torch
import torch.nn as nn
import torch.optim as optim
import torchvision
import torchvision.transforms as transforms
import matplotlib.pyplot as plt
import numpy as np
  
```

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Farukh Hashmi Mohammad (Presenting, annotating)



The Jupyter Notebook displays the title "Making a Flower Classifier with VGG19" and the subtitle "Loading the VGG19 Model". The code cell contains the following Python code:

```
In [*]: from keras.applications import VGG19

# VGG16 was designed to work on 224 x 224 pixel images sizes
img_rows = 224
img_cols = 224

# Loads the VGG16 model
```

Aruna s

Farukh Hashmi Mohammad

42 others

4:11 PM | nun-dyss-qye

Farukh Hashmi Mohammad (Presenting, annotating)



The presentation slide features the logo of the National Institute of Technology Warangal and the title "Deep Learning Hands-On". The presenter is identified as Dr. Md. Farukh Hashmi, Assistant Professor at NIT Warangal.


Aruna s

Farukh Hashmi Mohammad

44 others

2:14 PM | nun-dyss-qye

Aditya Gupta (Presenting, annotating)



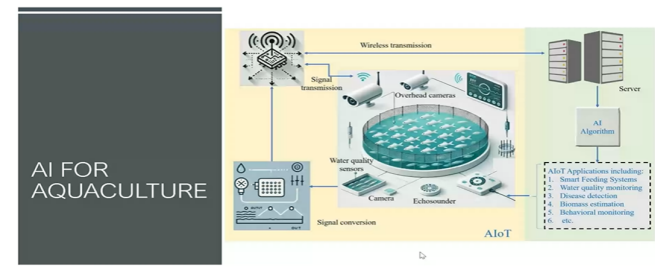
The presentation slide is titled "Generative AI Solutions for Aquaculture Industry" and features a background image of blue fish. The presenter is Dr. Aditya Gupta, with the email address aditya.gupta@uia.no. Logos for UiA and CAIR (Centre for Artificial Intelligence Research) are also present.

Aruna s

30 others

2:06 PM | nun-dyss-qye

Aditya Gupta (Presenting, annotating)



The diagram illustrates an AI for Aquaculture system. It shows a circular tank with various sensors (Water quality sensors, Camera, Echometer) connected to a central AIoT hub. The hub is linked to a Server and a Wireless transmission unit. A list of AIoT Applications is provided:

- 1. Smart Feeding System
- 2. Water quality monitoring
- 3. Disease detection
- 4. Breeding estimation
- 5. Behavioral monitoring
- etc.

Aruna s

34 others

2:09 PM | nun-dyss-qye

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Farukh Hashmi Mohammad (Presenting, annotating)

Object Detection
By
Dr. Md. Farukh Hashmi
Assistant Professor
NIT Warangal

A Aruna s

F Farukh Hashmi Mohammad

E F 42 others

ramesh kumar Gembali

4:17 PM | nun-dyss-qye

Jalidhar (Presenting, annotating)

Plant Diseases Detection
Aim of this research work is to design and develop an Automated Real-Time Plant Disease Detection Tool using Deep Learning.

A Aruna s

J Jalidhar

E D 44 others

ramesh kumar Gembali

2:09 PM | nun-dyss-qye

Shagysashree Led (Presenting, annotating)

Salient Object Detection (SOD)
• Detection of saliency by eyes:
• Parallel, fast and simple pre-attentive process
• Movement
• High contrast
• Intensity
• Slow and complex attention process

Eyes first focus here
Eyes later notice the cat and baby.

B Shagysashree...

A Aruna s

D Deepika YM...

S Shivani Shar...

P V 32 others

ramesh ku...

8:16 AM | nun-dyss-qye

Sambit Bakshi (Presenting, annotating)

The Rise & Rise of Biometric Systems
IEEE Systems Council DL
SAMBIT BAKSHI
National Institute of Technology Raourkela INDIA

S Sambit Bakshi

A Aruna s

H Dr.GVR Sagar

H HIRDAYNATH KHANDAGA...

S 39 others

ramesh kumar Gembali

1:08 PM | nun-dyss-qye