



Academic
Staff College

RESEARCH AND INDUSTRY ORIENTED PIPELINES FOR CONSTRUCTING ML APPLICATIONS

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FDP on **RESEARCH AND INDUSTRY ORIENTED PIPELINES FOR CONSTRUCTING ML APPLICATIONS** by Department of ECE, KLEF, KLEF-Reg.

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Thur 15-09-2022 11:01AM

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Ref: KLEF/RO/ASC/2022-23

Date: 15-09-2022

Orders of the Pro Vice Chancellor dt. 15-09-2022

CIRCULAR

Sub: FDP on RESEARCH AND INDUSTRY ORIENTED PIPELINES FOR CONSTRUCTING
ML APPLICATIONS "by Department of ECE, KLEF-Reg. Ref: E-mail dated 15-09-2022.

This is to inform that the Department of Mechanical Engineering, KLEF, is organizing a
One Week Faculty Development Program, as per the details given below.



Title: RESEARCH AND INDUSTRY ORIENTED PIPELINES FOR CONSTRUCTING ML APPLICATIONS

Content:

Research and industry-oriented pipelines for constructing machine learning (ML) applications are crucial for bridging the gap between theoretical advancements and practical implementation. These pipelines integrate cutting-edge research findings with industry requirements, ensuring robustness, scalability, and efficiency in ML systems. By leveraging the latest methodologies, frameworks, and best practices, these pipelines streamline the development process, facilitating the rapid deployment of ML solutions across diverse domains.

Resource Person:

1. Dr. M. Vinod Kumar, Associate Professor, Bapatla Engineering College
2. Mr. Nanda Kishore Mallapragada, Senior Data Scientist, Gramener
3. Dr. B. Kranthi Kiran, Professor, JNTUH
4. Mr. M. Teja Kiran Kumar from Yantrisiksha Technologies

Duration : 20th-24th September 2022

For any queries, Contact Coordinator, Department of ECE

REGISTRAR

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Thanks& Regards



Prof. Y. V. S. S. V. Prasada Rao
Ph.D(Mech. Engg.), DPM., MBA (Fin & HR), FICWA
REGISTRAR

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Phone No. 0863 - 2399999; www.klef.ac.in; www.klef.edu.in; www.kluniversity.in





**Academic
Staff College**



FIVE DAYS FDP Program on

RESEARCH AND INDUSTRY ORIENTED PIPELINES FOR CONSTRUCTING ML APPLICATIONS

On

20-09-2022 TO 24-09-2022

RESOURCE PERSONS

Dr. M. Vinod Kumar, Assoc Professor, Bapatla Engg College,

Mr. Nanda Kishore M., Senior Data Scientist, Gramener

Dr. B. Kranthi Kiran, Professor, JNTUH

Mr. M. Teja Kiran Kumar, Yantrisiksha Technologies

ORGANISED BY

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VENUE: Venue



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Program Schedule

Session	Date	Resource Person	Topic
1	20/09/2022	Dr. M. Vinod Kumar	Train Rolling stock examination Assistant: A Computer vision approach to Manual rolling stock examination
2	20/09/2022	Dr. M. Vinod Kumar	The VGG 16 Network
3	21/09/2022	Dr. D. Anil Kumar	Natural Language Processing in Tensorflow
4	21/09/2022	Dr. D. Anil Kumar	The ResNet
5	22/09/2022	Mr. Nanda Kishore Mallapragada	Enhance marketing strategies using NLP
6	22/09/2022	Mr. Nanda Kishore Mallapragada	Machine Learning Vs Deep Learning Experience
7	23/09/2022	Dr. B. Kranthi Kiran	Applications of AI & ML
8	23/09/2022	Dr. B. Kranthi Kiran	Speech Processing Models with deep learning
9	24/09/2022	Mr. M. Teja Kiran Kumar from Yantrisiksha Technologies	Image Captioning Models
10	24/09/2022	Dr. P V V Kishore	Speech processing deep learning model building pipelines





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Report of A five day FDP

on

RESEARCH AND INDUSTRY ORIENTED

PIPELINES FOR CONSTRUCTING

ML APPLICATIONS

20th-24th September, 2022.

Organized by Signal Processing Research Group

Department of ECE, KLEF

Signal Processing Research Group has conducted a five days faculty development programme to strengthen the faculty in the deep learning domain. The main focus of this FDP is to provide a hand on sessions for the faculty to educate on futuristic directions of vision computing and biomechanics research area.. Five eminent resource persons were delivered the sessions. We have received a total of 100 registrations for this FDP from all over the country. Among all the registrations we have 49 active participants for this FDP and the certificates were issued to all the active participants (>80% attendance). The detailed report of all the sessions is as follows.

Day-1 Session-1: (20/09/2022)

The session was started at 10AM with inauguration followed by the welcome speech by the conveners. The session was handed over to the resource person Dr. M. Vinod Kumar, Associate Professor, Bapatla Engineering College. The session topic is 'Train Rolling stock examination Assistant: A Computer vision approach to Manual rolling stock examination'.

Hands-on session was taken by the resource person. He guided the participants to install anaconda and the required packages. He explained how to program with tensorflow. He taught how to create a neural network model in python.

Day-1 Session-2: (20/09/2022)



The session-2 was taken again by Dr. M. Vinod Kumar, Associate Professor, Bapatla Engineering College, and the topic is 'The VGG 16 Network'. He explained the basic CNN architecture i.e. VGG 16. A brief introduction to deep learning architectures was given for the 30 minutes and then he taken hand-on. All the participants were actively participated and created their first VGG model for object recognition task.

Day-2 Session-3: (21/09/2022)

The session-3 was taken by the Dr. D. Anil Kumar, on the topic 'Natural Language Processing in Tensorflow'. A brief introduction to NLP was given and the application areas were discussed in depth. Later a Hands-on session was taken by the resource person and he showed how to implement text recognition and text categorization using deep learning techniques.

We recorded the maximum attendance for this session. The participants were very much satisfied with the session. An interactive question and answer session was lasts for 30 minutes. The session was closed at 1:30PM.

Day-2 Session-4: (21/09/2022)

The session 4 was continued by Dr. D. Anil Kumar Assistant Professor, PACE Institute of Technology & Sciences (Autonomous) and the topic covered is 'The ResNet'. He explained how the residual networks works for specific applications. He implemented the human action recognition and the sign language recognition resnet models to the participants.

Day-3 Session-5: (22/09/2022)

The session 5 was again taken by the resource person Mr. Nanda Kishore Mallapragada, Senior Data Scientist, Gramener and the topic covered is 'Enhance marketing strategies using NLP'.

He showed how to implement YOLO architectures for object detection and human face detection and recognition. He implemented an application called student attendance monitoring system with the help of YOLO architectures. At the end of the session he clarified the participants doubts.

Day-3 Session-6: (22/09/2022)

This session was taken by Mr. Nanda Kishore Mallapragada, Senior Data Scientist, Gramener and he covered the topic 'Machine Learning Vs Deep Learning Experience'.



He explained the basics of machine learning and deep learning. He also explained how the deep learning is differ from machine learning and various application areas of both the concepts. He showed various benefits of implementing deep learning algorithms.

Day-4 Session-7: (23/09/2022)

The session 7 was taken by the industry expert Dr. B. Kranthi Kiran, Professor, JNTUH and the topic chosen by him is 'Applications of AI & ML'.

He explained the Triplet loss networks and how they perform classification based on distance metrics. The session was very interesting as it is a new concept of deep learning. He also showed some implemented applications in their company.

Day-4 Session-8: (23/09/2022)

The afternoon session was continued 'Speech Processing Models with deep learning'.

It was a great session by him. In this session he explored various projects done by them in their speech processing research laboratory. He dealt with various problems being faced while capturing and processing the speech signals.

Day-5 Session-9: (24/09/2022)

The session 9 was taken by the industry expert Mr. M. Teja Kiran Kumar from Yantrisiksha Technologies and the topic delivered is 'Image Captioning Models'.

He has educated the participants in using AWS services from Amazon for high end applications. He gave a demo on how they are working with cricket bowling and batting analysis. He also gave a demo on how to perform labelling which is a more important task in preparing training data. He explained how to organize the training, testing and validation data sets. He also explained how to fine tune the network parameters / hyper parameters to attain more accuracy.

Day-5 Session-10: (24/09/2022)

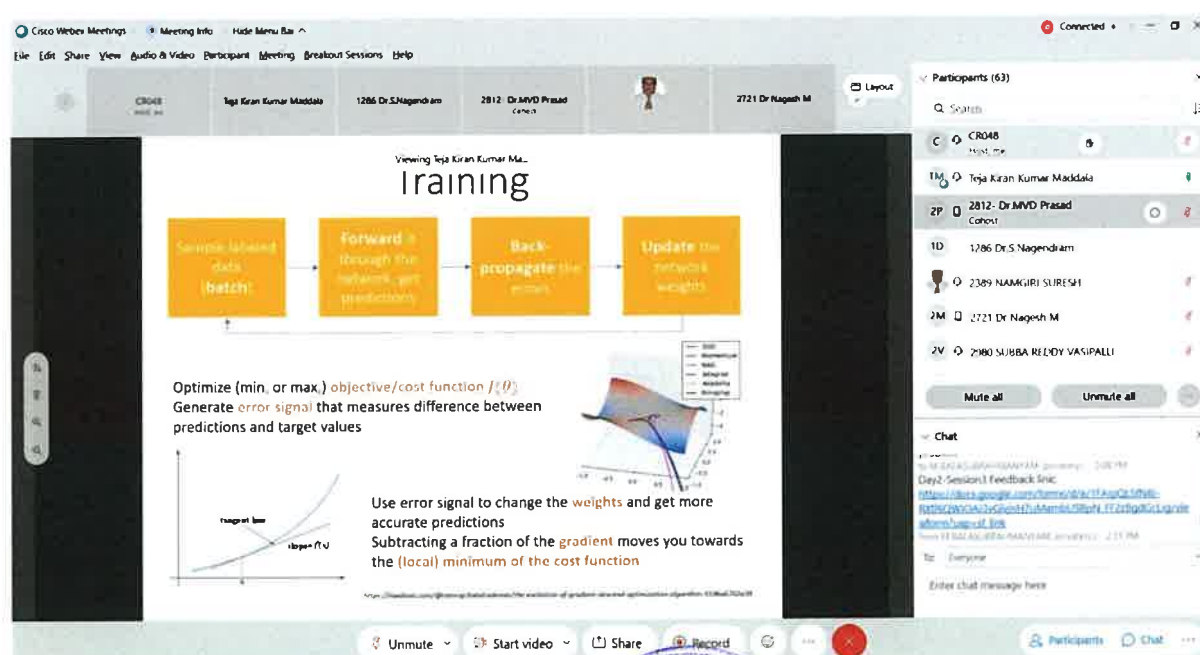
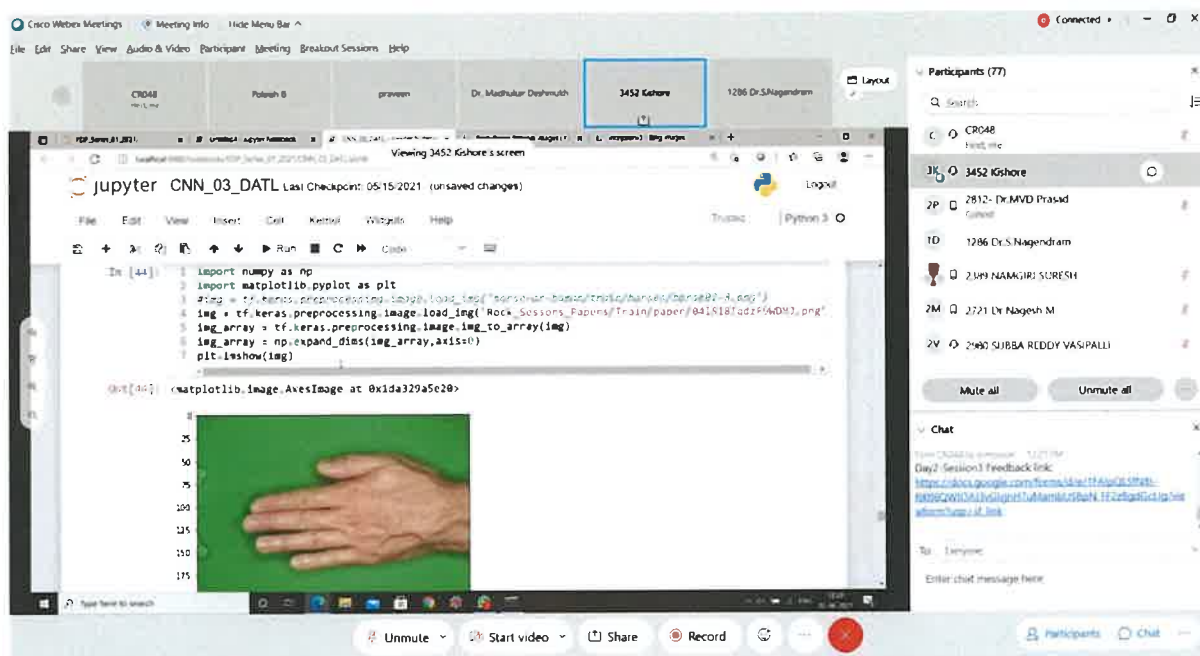
This was the last session of the FDP and the session was taken by an academic expert Dr. P V V Kishore. The topic he chosen for this session is 'Speech processing deep learning model building pipelines'.



He explained some speech processing pipelines for researchers. He continued his session by giving suggestions on how to choose a research topic and how to write a research articles and the essential sections that should be there in one's research article.

Finally the FDP was ended with a valedictory and vote of thanks from the organizers.

Few screen shots were taken during the FDP and are kept here for your reference.



Viewing Teja Kiran Kumar Ma...

ResNet and its Derivatives:

Residual Block

layer name	output size	18-layer	34-layer	50-layer	101-layer	152-layer
conv1	112 × 112	7 × 7, 64, stride 2				
		3 × 3 max pool, stride 2				
conv2.x	56 × 56	$\begin{bmatrix} 1 \times 1, 64 \\ 3 \times 3, 64 \end{bmatrix} \times 2$	$\begin{bmatrix} 3 \times 3, 64 \\ 3 \times 3, 64 \end{bmatrix} \times 3$	$\begin{bmatrix} 1 \times 1, 64 \\ 3 \times 3, 64 \\ 1 \times 1, 256 \end{bmatrix} \times 3$	$\begin{bmatrix} 1 \times 1, 64 \\ 3 \times 3, 64 \\ 1 \times 1, 256 \end{bmatrix} \times 3$	$\begin{bmatrix} 1 \times 1, 64 \\ 3 \times 3, 64 \\ 1 \times 1, 256 \end{bmatrix} \times 3$
conv3.x	28 × 28	$\begin{bmatrix} 1 \times 1, 128 \\ 3 \times 3, 128 \end{bmatrix} \times 2$	$\begin{bmatrix} 1 \times 1, 128 \\ 3 \times 3, 128 \end{bmatrix} \times 4$	$\begin{bmatrix} 1 \times 1, 128 \\ 3 \times 3, 128 \\ 1 \times 1, 512 \end{bmatrix} \times 4$	$\begin{bmatrix} 1 \times 1, 128 \\ 3 \times 3, 128 \\ 1 \times 1, 512 \end{bmatrix} \times 4$	$\begin{bmatrix} 1 \times 1, 128 \\ 3 \times 3, 128 \\ 1 \times 1, 512 \end{bmatrix} \times 8$
conv4.x	14 × 14	$\begin{bmatrix} 1 \times 1, 256 \\ 3 \times 3, 256 \end{bmatrix} \times 2$	$\begin{bmatrix} 1 \times 1, 256 \\ 3 \times 3, 256 \end{bmatrix} \times 6$	$\begin{bmatrix} 1 \times 1, 256 \\ 3 \times 3, 256 \\ 1 \times 1, 1024 \end{bmatrix} \times 6$	$\begin{bmatrix} 1 \times 1, 256 \\ 3 \times 3, 256 \\ 1 \times 1, 1024 \end{bmatrix} \times 23$	$\begin{bmatrix} 1 \times 1, 256 \\ 3 \times 3, 256 \\ 1 \times 1, 1024 \end{bmatrix} \times 36$
conv5.x	7 × 7	$\begin{bmatrix} 1 \times 1, 512 \\ 3 \times 3, 512 \end{bmatrix} \times 2$	$\begin{bmatrix} 1 \times 1, 512 \\ 3 \times 3, 512 \end{bmatrix} \times 3$	$\begin{bmatrix} 1 \times 1, 512 \\ 3 \times 3, 512 \\ 1 \times 1, 2048 \end{bmatrix} \times 3$	$\begin{bmatrix} 1 \times 1, 512 \\ 3 \times 3, 512 \\ 1 \times 1, 2048 \end{bmatrix} \times 3$	$\begin{bmatrix} 1 \times 1, 512 \\ 3 \times 3, 512 \\ 1 \times 1, 2048 \end{bmatrix} \times 3$
	1 × 1	average pool, 1000-d fc, softmax				
FLOPs		1.8×10^9	3.6×10^9	3.8×10^9	7.6×10^9	11.3×10^9

Viewing Teja Kiran Kumar Ma...

Performance on the COCO Dataset

Model	Task	Test mAP	FLOPs	FPs	Qty	Weight
SSD300	COCO baseline	34.2	-	41	10	100
SSD512	COCO baseline	35.0	-	41	10	100
YOLOv2-baseline	COCO baseline	48.7	62.9B	40	40	weights
YOLOv2-tiny	COCO baseline	25.1	5.1B	244	40	weights
SSD300	COCO baseline	34.2	-	41	10	100
SSD512	COCO baseline	35.0	-	41	10	100
YOLOv2-baseline	COCO baseline	48.7	62.9B	40	40	weights
YOLOv2-tiny	COCO baseline	25.1	5.1B	244	40	weights
SSD300	COCO baseline	34.2	-	41	10	100
SSD512	COCO baseline	35.0	-	41	10	100
YOLOv2-baseline	COCO baseline	48.7	62.9B	40	40	weights
YOLOv2-tiny	COCO baseline	25.1	5.1B	244	40	weights

How It Works

These detection systems use various classifiers of features to perform detection. They take the model to be trained to find the bounding boxes and labels, which are used to detect the objects.



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Participants (51)

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PS P. Syam Sunder

RG Raja Gopal

R RamakrishnaThirumuru

RK RAVINUTALA KOTESWARARAO

S4 Sekar R 4301

S Shivani

TB TVA BHANUPRAKASH

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please share the screen sir

from SIVANI to everyone 12:51 PM

vir, your screen is not shared

from M SIVANI to everyone 12:51 PM

is any test

To: Everyone

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What is research?

Here Important is Search in Re'search'

It is very important to know what is the state of the art approach for the problem you have selected

Research starts after identifying gaps in literature

What to do is important than how to do

Writing research paper/thesis is like making a hit movie

Ultimate job in the world - Research Faculty !!!!

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Participants (70)

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A Anil

ID 1286 Dr.S.Nagendram

2199 NAMGIRI SURESH

2121 Dr.Nagesh M

2134 Mr.G.SIVANAGESWARA RAO

2192 SREEVARDHAN CHEERLA

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from M SIVANAGESWARA RAO to everyone 1:11 PM

if u provide certificate sir

from Dr G Ch Sati to everyone 1:11 PM

excellent speech Sir

To: Everyone

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Tips for paper writing/thesis writing

Abstract

Introduction

Baseline approaches

Proposed approach

Results and discussion

Summary

References



Dr.M.Suman,

HOD ECE

List of Participants

S.No	Emp No	Name of the employee	Designation	Department
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3	2272	DR.KUTHURI NARASIMHA RAJU	PROFESSOR	ELECTRICAL AND ELECTRONICS ENGINEERING
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25	731	DR.MADHAVAREDDY VENKATA NARAYANA	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
26	841	DR.SUMAN MALOJI	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
27	855	DR.IMMADI GOVARDHINI	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
28	928	DR.CHINNARI SRI KAVYA KORADA	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
29	1737	DR.B.T.P.MADHAV	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
30	2326	DR.KOTAMARAJU SARAT KUMAR	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING



31	2457	DR.KAKARLA HARI KISHORE	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
32	2469	DR.MIRYALA SRIDHAR	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
33	2684	DR.VENKATA RATNAM DEVANABOYINA	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
34	2838	DR.GHALI VENKATA SUBBA RAO	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING
35	2045	R.KALLAKUNTA RAVI KUMAR	PROFESSOR	ELECTRONICS AND COMMUNICATION ENGINEERING

faculty attended
fdp in online mode.

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REGISTRAR
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Guntur District, Andhra Pradesh.



This is to certify that

DR.JYOTHI RAVI KIRAN KUMAR DABBAKUTI

Has participated in the

Five-day Faculty Development Program on
“Research and Industry Oriented Pipelines for Constructing ML Applications”

20.09.2022 to 24.09.2022.

During _____.


Principal
ASC