



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

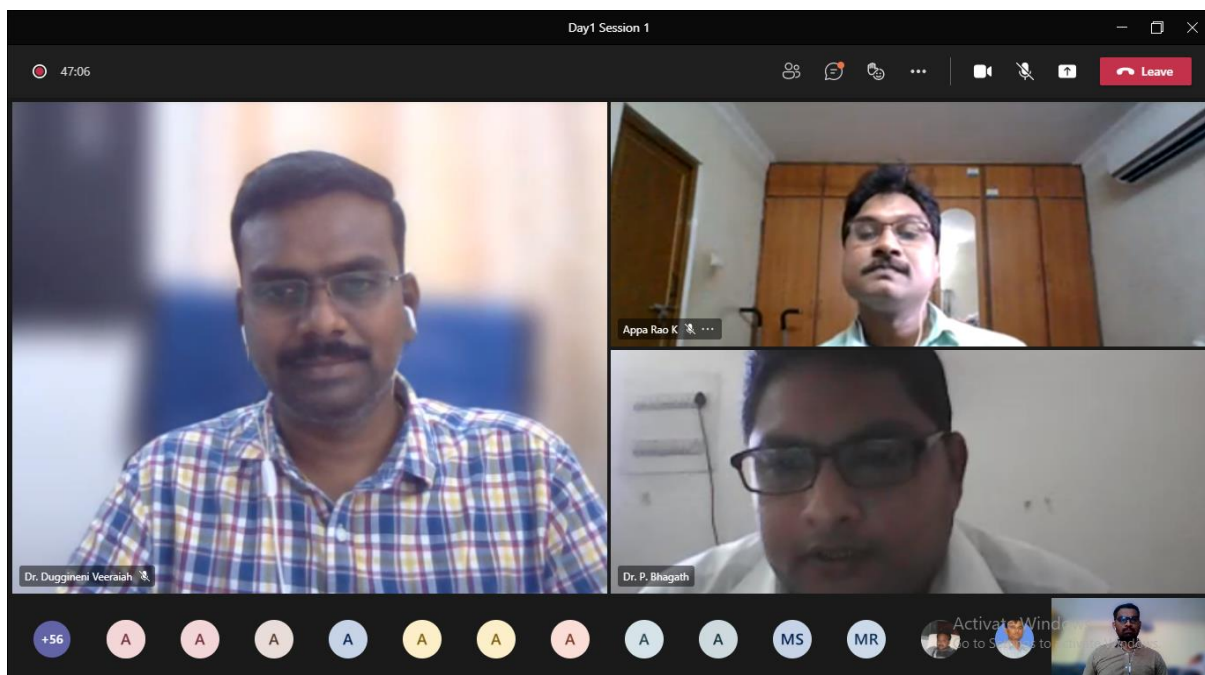
Report on Five Day Online Faculty Development Program on “Applied Data Science: Tools and Techniques” (29th May 2021 – 02nd June 2021)

Lakireddy Bali Reddy College of Engineering (A) has organized A Five-Day Online Faculty Development Programme on “**Applied Data Science: Tools and Techniques**” from 29th May – 02nd June 2021. This training program was organized by Department of CSE and have received an overwhelming response with more than 600 registrations. Out of them, we have shortlisted only 380 participants form various prestigious institutes like IITs, NITs and State Universities. Participants constitute a good mixture of Faculty, research scholars and PG students.

Date: 29 /05/2021 Inauguration

FDP was inaugurated on 29/05/2021 by Convener of FDP Dr. D. Veeraiah, Professor and HOD, CSE Department and Dr. K. Appa Rao, principal, L.B.R.C.E has explained the importance of Faculty Development Programs and given his best wishes. Dr. M Srinivasa Rao, Dean of Academic affairs has explained the importance of Data Science in Engineering. Dr.P.Bhagath, Coordinator of the FDP introduced the resource persons Mr. Ritesh Ratti, Senior Data Scientist, Grab, Singapore, Dr. Akash Anil, Asst. Professor, SRM University A.P, Mr. Nahar Singh, Sr. AI Specialist, Continental Automotive India Pvt. Ltd., Bangalore.

Dr.P.Bhagath has provided warm welcome to all the delegates and participants to the FDP. In his speech, Dr.P.Bhagath has highlighted the main objectives and importance of this Faculty Development Programme. In his Inaugural Speech, Dr. D. Veeraiah, HoD CSE Department gave his insights about Data Science and its Applications. He quoted that Data Science has became the future of data analysis and every organization is investing a lot for their data analysis and get good insights from data to improve their profits.



*Inauguration Speech by
Dr. K Appa Rao, Principal and Dr. D Veeraiah, HOD, Department of CSE*

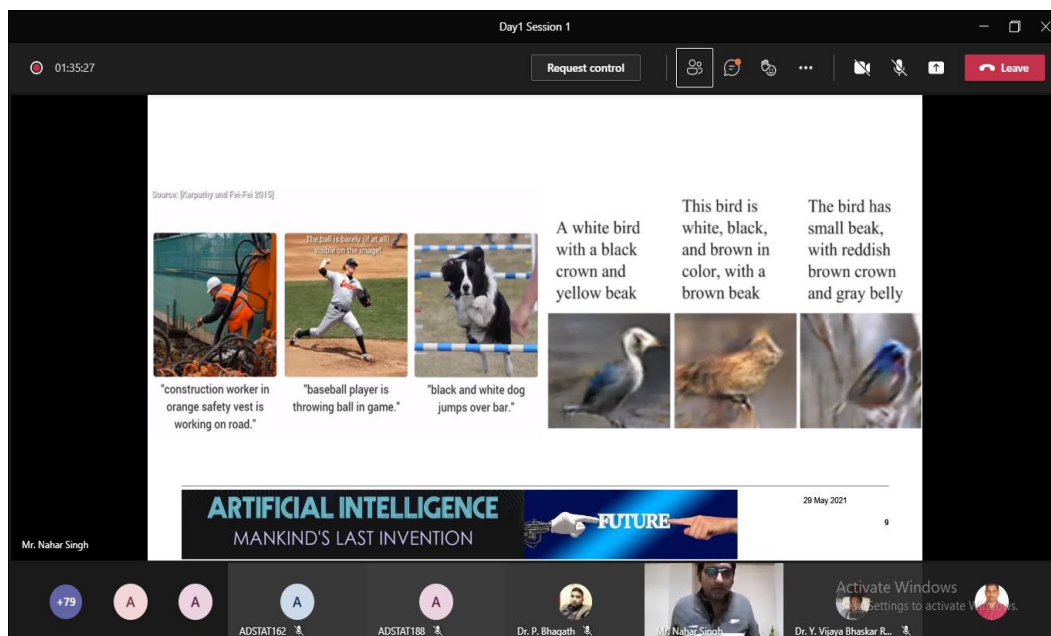
Day 1 -- Session 1 (29/05/2021)

The first session of the FDP is handled by Mr. Nahar Singh, he has done is PG from IIT Guwahati, he is pursuing his Doctoral Degree from Chung-Ang University. Currently he is working senior manager for Artificial Intelligence, Continental Automotive, Bangalore.

In this session the speaker has provided a brief introduction about Artificial Intelligence, Machine Learning and Natural Language Processing. He had explained two important machine algorithms Linear Regression and Logistic Regression briefly with examples. Finally, there is a hands-on in python where exhibited the working of Logistic expression.

Topics Covered in the Session:

1. Introduction to AI
2. Linear Regression
3. Logistic Regression
4. Hands-on



Day1 Session1 Presentation by speaker Mr. Nahar Singh

Day1 Session 2 (29/05/2021)

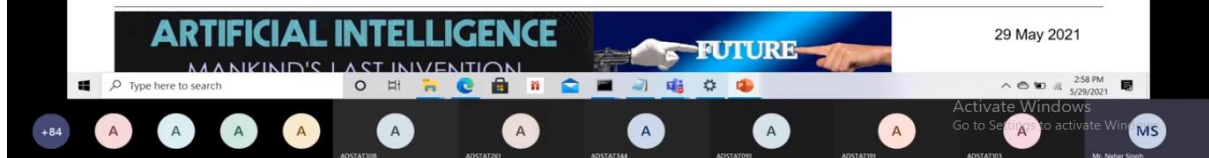
This session is handled by Mr. Nahar Singh, in this session the speaker presented a brief introduction to Neural Networks, Convolutional Neural Networks (CNN), Deep Learning, Application of Deep Learning TensorFlow. Pictorially he explained how a CNN could be useful for classifying, how CNN's are represented, what are different layers in CNN how each layer is processed. Then he had provided a Hands-on session for CNN.

Topics Covered in the session

1. Neural Networks
2. Convolutional Neural Networks
3. Hand-On for classifying Cat and Dog by using CNN.
4. Deep Learning Applications
5. Computer Vision algorithms
6. Hands-On for Deep learning application demo

What is a Neural Network

- › Neural Networks are a beautiful biologically-inspired programming paradigm which enables a computer to learn from observational data.
- › Deep Learning is a powerful set of techniques for learning in neural network - *Michael Nielsen*.
- › Neural Network is basically an algorithm that learns on the basis of pairs of examples (input and output data), detects some kind of patterns, and predicts the output based on an unseen input data.
- › It consist of artificial neurons(nodes) with input and out data connected to other such artificial neurons to form a network.



Day1 Session 2 Presentation by speaker Mr. Nahar Singh

Day 2 Session 1 (30/05/2021)

This session is handled by Mr. Nahar Singh. The speaker discussed about Recurrent Neural Networks, EfficientNet, Object detection, Transfer Learning, Module fusion, Self-Supervised Learning, RCNN. Provided some examples for every topic he discussed. Provided a comparison between CNN and RNN.

Topics Covered in the Session

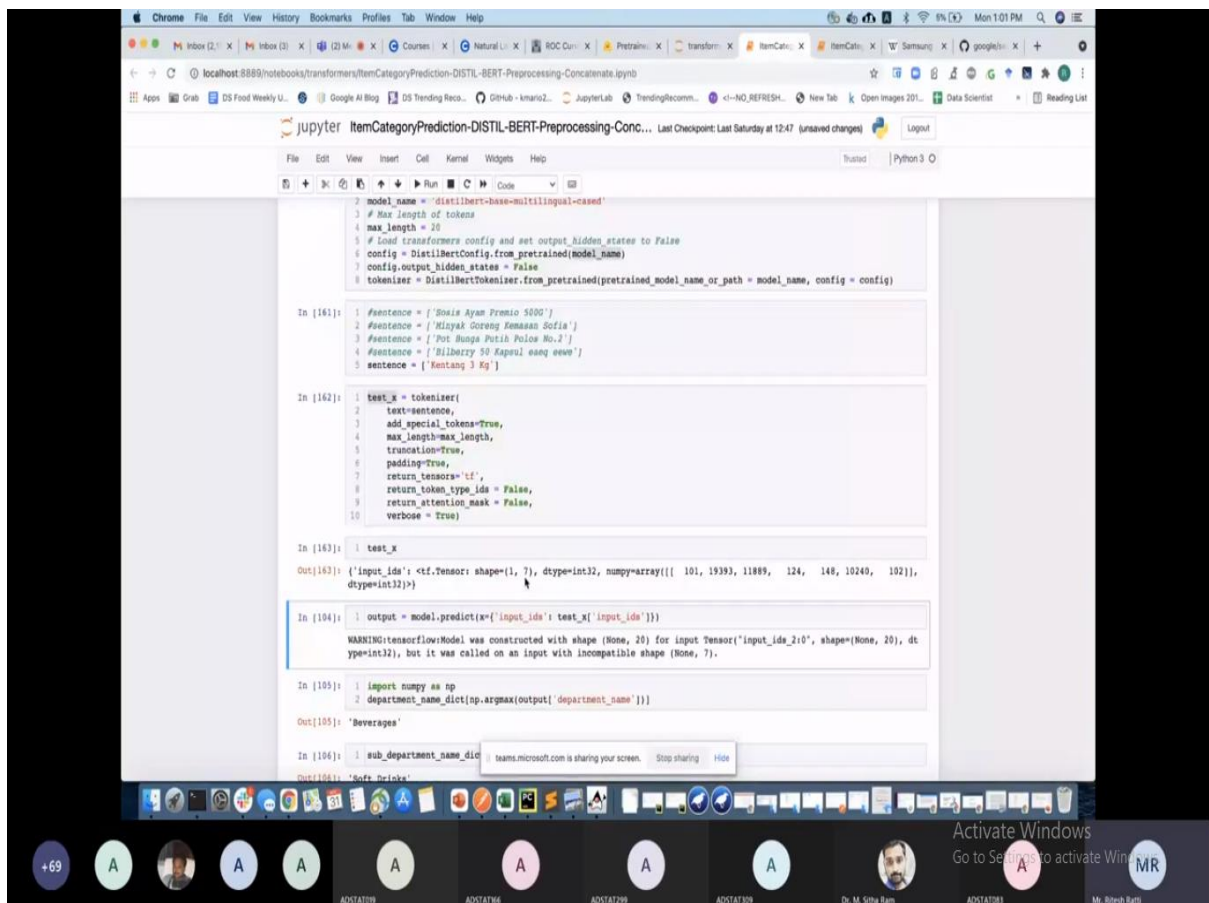
1. Recurrent Neural Networks
2. Transfer Learning
3. EfficientNet
4. Object detection
5. Module fusion,
6. Self- Supervised Learning
7. Hands-On Roboflow EfficientNet Classification and Transfer Learning

A screenshot of a Jupyter Notebook interface. The notebook title is 'Regularization_CNN_dog_vs_cat.ipynb'. The code in the cell includes plotting loss and accuracy, and a function to run a test harness. The code is as follows:

```
# PLOT LOSS
plt.subplot(211)
plt.title('Cross Entropy Loss')
plt.plot(history.history['loss'], color='blue', label='train')
plt.plot(history.history['val_loss'], color='orange', label='test')
# PLOT accuracy
plt.subplot(212)
plt.title('Classification Accuracy')
plt.plot(history.history['accuracy'], color='blue', label='train')
plt.plot(history.history['val_accuracy'], color='orange', label='test')
# save plot to file
filename = sys.argv[0].split('/')[-1]
plt.savefig(filename + '_plot.png')
plt.close()

# run the test harness for evaluating a model
def run_test_harness():
    # define model
    model = define_model()
    # create data generator
    datagen = ImageDataGenerator(rescale=1.0/255.0)
    # prepare iterators
    train_it = datagen.flow_from_directory('dataset_dogs_vs_cats/train/',
                                         class_mode='binary', batch_size=8, target_size=(200, 200))
    test_it = datagen.flow_from_directory('dataset_dogs_vs_cats/test/',
                                         class_mode='binary', batch_size=8, target_size=(200, 200))
    # fit model
    history = model.fit_generator(train_it, steps_per_epoch=len(train_it),
                                validation_data=test_it, validation_steps=len(test_it), epochs=15, verbose=0)
    # evaluate model
```

Day2 Session1 Presentation by speaker Mr. Nahar Singh



Day3 Session1 Presentation by speaker Mr. Ritesh Ratti

Day 3 Session 2 (31/5/2021)

This session is taken by Dr. Akash Anil. Dr. Akash has completed his PG and Ph.D from IIT Guwahati, he has works as Associate Project Manager in IITG later he has worked as Data Scientist In KPGM India. Now he is currently working as Assistant Professor in SRM University Amarvathi, Andhra Pradesh.

The speaker started the session with Network problems and their solutions followed by introduction to Graph Neural Networks (GNN) and Deep Learning approaches for GNN. Finally ended with a demo on NetworkX.

Topics covered in the session.

1. Network Types
2. Applications of Network Analysis
3. Network Science Methodologies
4. Demo on NetworkX

Type of Problems: Examples

Application of Network Analytics/Network Science

Image Credit: Stanford CS224W: Machine Learning With Graph

Akash Anil, Assistant Prof., CSE, SRMAP Graph Analytics May 31, 2021 5 / 21

Day3 Session2 Presentation by speaker Dr. Akash Anil

Day 4 Session 1 (01/6/2021)

This session is taken by Dr. Akash Anil. The session started with Network Representation Learning and its applications with more emphasis on word embedding and optimization in embedding. Finally Demo on word embedding is presented.

Topics Covered in the session

1. Network Representation Learning / Network Embedding.
2. Word Embedding.
3. Optimization in embedding
4. Demo

Word Embedding

Motivation: Word Embedding (Word2Vec):

Barak Obama was the president of United States of America

Window = 1

Input (I)	Context / Output (C)
Barak	Obama
Obama	Barak
president	Obama
president	United
United	president
United	States
States	United
Sates	America
America	States

Skip-Gram Model

Max $P(C|E(I))$

Akash Anil, Assistant Prof., CSE, SRMAP Graph Analytics June 1, 2021 8 / 13

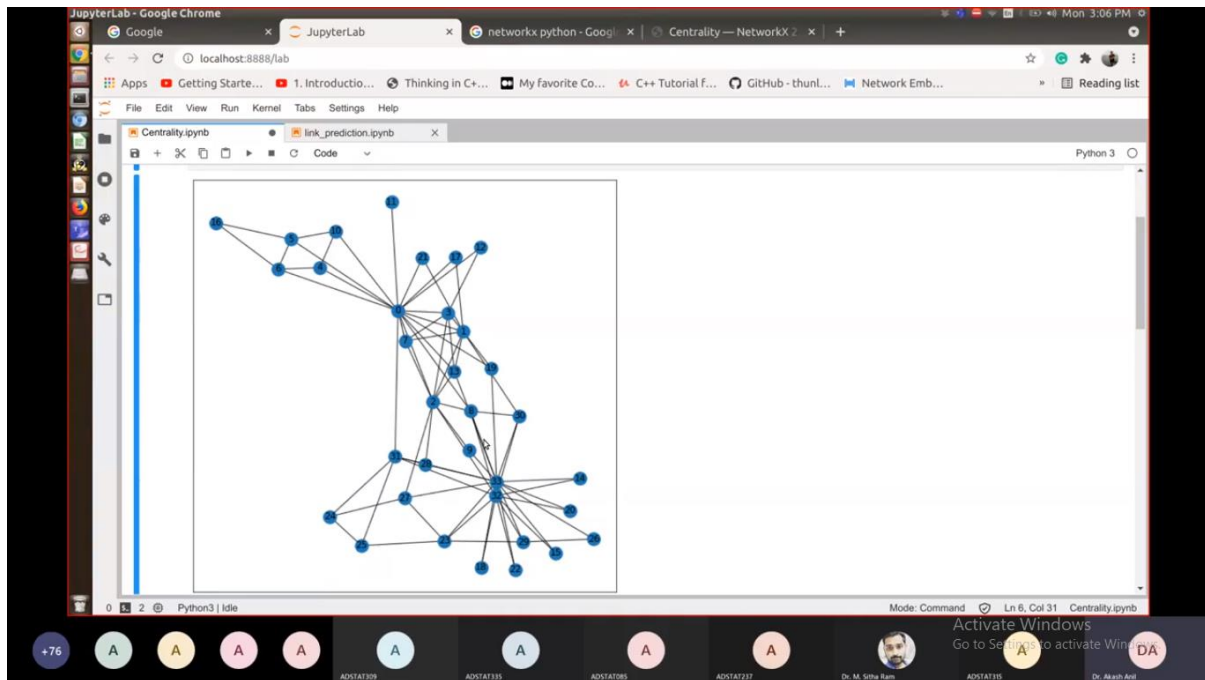
Day4 Session 1 Presentation by speaker Dr. Akash Anil

Day 4 Session 2 (01/6/2021)

This session is taken by Dr. Akash Anil. In this session the speaker has given more importance to the Graph Neural Networks and its applications. Finally a demo Models of GNN is Provided.

Topics Covered in the session

1. Graph Neural Networks
2. Demo



Day4 Session 2 Presentation by speaker Dr. Akash Anil

Day 5 (02/6/2021)

Topic: Applications of Graph Neural Networks and Demo

Valedictory Session

On the Valedictory Session, Dr. D. Veeraiah, Professor and HOD, CSE Department and Convener of FDP joined the session as a Chief Guest along with the resource persons Mr. Nahar Singh, Mr. Ritesh Ratti and Dr. Akash Anil and Dr. P. Bhagath, Dr. M. Sitha Ram, Associate Professor, CSE Department and Coordinators of FDP.

Dr. D. Veeraiah, Professor and HOD, CSE Department, in his valedictory addressing, thanked every participant for spending their valuable time and attending 5 day FDP. Also congratulated the Program coordinators Dr. P. Bhagath, Dr. M. Sitha Ram and co-coordinators Mr. G. V. Suresh, Mr. T. Uday Kumar, Mr. V. Siva Krishna, Mr. Sk. Johny Basha, Mr. S. Srinivasa Reddy for organizing the FDP in a successful manner.

Further, he appreciated all the Teaching and Non-Teaching Staff Members of CSE Department for promoting such kind of programme for the faculties who attended from all over India. At the end of the valedictory session, vote of thanks was given by Dr. M. Sitha Ram, Coordinator of the FDP in which he has been paid his gratitude towards all the participants who has spared their valuable time for attending this FDP. He also expressed the gratitude to the Resource Persons, Mr. Nahar Singh, Mr. Ritesh Ratti and Dr. Akash Anil for giving their valuable time for our participants and sharing their knowledge to them.

Nevertheless, he expressed his sincere thanks to Sri. G. Srinivasa Reddy, President, Dr. K. Appa Rao Principal and Dr. D. Veeraiah, HOD, CSE Department.

“We are highly thankful to the Management, Principal and Head of the Department for giving us an opportunity to organize this FDP in our campus and hope we will find the support in future also for organizing such kind of activities.”



Coordinator
(Dr. P. Bhagath)



Coordinator
(Dr. M. Sitha Ram)



Convener
(Dr. D. Veeraiah)



Principal
(Dr. K. Appa Rao)