

Coimbatore Institute of Technology, COIMBATORE-14

CGC-CLAP CELL OF CIT

Course on AI for Assistive Technology

Duration : 5 Saturdays from 13.08.2022

Report

PRE-REQUISITE WEBINAR- DEEP LEARNING COURSE

A webinar on “**Deep Learning**” was held on 13.08.2022 between 11.30 AM to 02.00 PM through the Google Meet Platform. To deliver the valuable content on Deep Learning, we had **Mr. Vishnu Karthiklu, ML Lead, QPiCloud, Bangalore as Resource Person**. The speaker started the session by providing insight on the basics of Machine Learning and its types like Regression, Classification etc. He also explained how the Residual Gradient Descent optimization algorithm is used to train machine learning models. The key topics discussed by him were Deep Learning, Convolutional Neural Networks and its layers. Furthermore, the students learned about various architectures of CNN like AlexNet, GoogleNet, VGGNet etc. The webinar had 57 registrations and 45 participants from various departments of the college.

Google Meet Link: <https://meet.google.com/bxd-xekk-hsz?pli=1>

Feedback Form Link:

<https://docs.google.com/forms/d/1sUTdivAcATFCCSAU4n2Np0xweUXudUYu1h7nfcBTq48/edit?ts=630308e2>

Screenshots of the Session:

The screenshot shows a Zoom meeting interface. At the top, a slide titled "Image classification" is displayed. The slide contains two bullet points: "Image classification refers to a process in computer vision that can classify an image according to its visual content." and "Image classification also categorizes detected objects into predefined classes by using a suitable classification technique that compares the image patterns with the target patterns." The slide has a small logo in the bottom left and the number "25" in the bottom right. Below the slide, the Zoom interface shows "Vishnu is presenting" with a camera icon. A gallery view of participants is shown below, with six tiles. Each tile has a circular profile picture, a name, and a status icon. The tiles are: 1. Profile picture 'K', name '20MSC26', status icon (muted). 2. Profile picture 'R', name '20MSC40', status icon (muted). 3. Profile picture 'S', name '20MSC47', status icon (muted). 4. Profile picture 'M', name 'You', status icon (muted). 5. Profile picture 'V', name 'Vishnu', status icon (video on). 6. Profile picture 'S', name '2039 others', status icon (muted).

Image classification

- Image classification refers to a process in computer vision that can classify an image according to its visual content.
- Image classification also categorizes detected objects into predefined classes by using a suitable classification technique that compares the image patterns with the target patterns.

Qπ. 25

Vishnu is presenting

K 20MSC26

R 20MSC40

S 20MSC47

M You

V Vishnu

S 2039 others

ResNet

- Residual Network (ResNet) is a Convolutional Neural Network (CNN) architecture which was designed to enable hundreds of convolutional layers.
- While previous CNN architectures had a drop off in the effectiveness of additional layers, ResNet can add a large number of layers with strong performance.

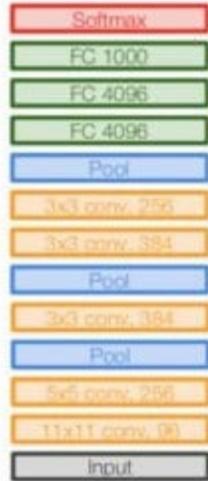


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Vishnu is presenting



AlexNet Architecture



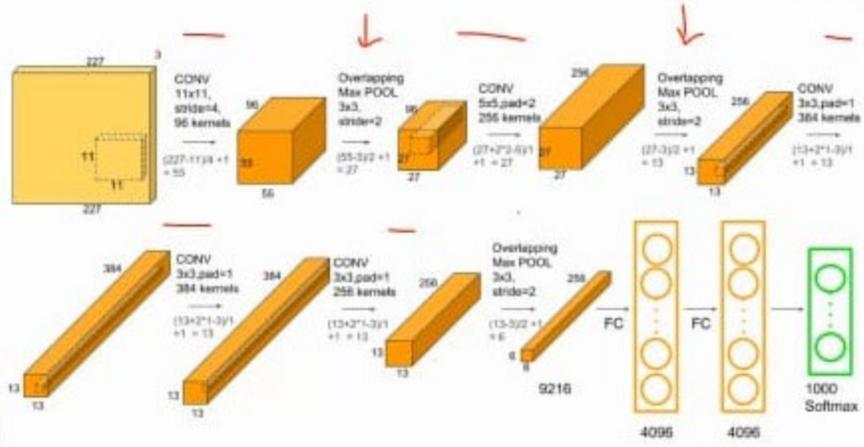
Qπ.

43

Vishnu is presenting



AlexNet Architecture



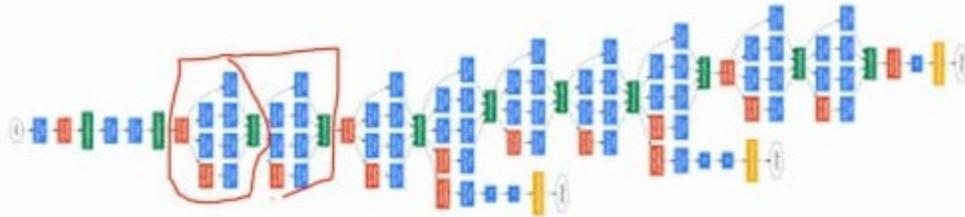
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Vishnu is presenting



GoogLeNet Architecture



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Vishnu is presenting



Comparison between models

- In every VGG architecture, all filters are of size 3×3 which is fixed.
- The idea here is that, two 3×3 filters almost cover the area of what a 5×5 filter would cover and also two 3×3 filters are cheaper than one 5×5
- Since there is very less number of calculations, VGGnet Outperforms other Complex CNN architecture computationally.

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AI for Assistive Technology

The course on “**AI for Assistive Technology**” was designed by DeepVisionTech.AI Pvt Ltd. Bangalore and handled by the founder Mr. Jayasudan M and co-founder Mr. Arul Praveen. The course was held for five Saturdays on 20.08.2022, 27/8/2022, 3/9/2022, 10/9/2022 and 24/9/2022 in Room No. 103, Computing block at CIT campus. The detailed day wise report is as follows.

DAY 1: 20/8/2022

The course was inaugurated in the presence of Mr. Jayasudan M, Mr. Arul Praveen and Dr.Valliappan Raman, H.o.D, B.Tech. AI & DS. Introduction about AI and the need for AI in assistive technology was given by Mr.Jayasudan M. He gave a brief explanation on the project “Model to identify whether a person is signing or not”, dataset creation and pre-processing. It was followed by Mr. Arul Praveen’s session on dataset creation, augmentation and pre-processing using OpenCV.



DAY 2: 27/8/2022

In this session, Mr. Arul Praveen explained about Deep Learning model training with hyper parameter tuning, performance metrics (accuracy, precision), evaluation (overfitting, underfitting) and validation (tensor board tool for validation), transfer learning with pretrained models and acknowledged with various resources for widening our knowledge in this domain. In the afternoon session, students worked on a model with benchmark datasets provided by the trainer.

DAY 3: 3/9/2022

During this session, students did their model training and evaluation separately and recorded its accuracy and improvised it. An introduction on streamlit was also given. Students were assigned tasks based on detection using absdiff images (no DL model involved) and detection using MediaPipe Pose model in OpenCV.

DAY 4: 10/9/2022

In this session, the trainer gave an introduction to Heroku, and students started the deployment with Streamlit. At the end of this session students created a webpage to detect whether a person is login or sign out from a live stream and its deployment on Heroku.

DAY 5: 24/9/2022

During this session, some of the students took seminars about their model's architecture, then followed by the explanation about Containerization (docker) and its deployment on Cloud.

To conclude, the training was really educational and beneficial to the students community. They had a lot of hands-on practice sessions, which really helped them to grasp the concepts easily.

Valedictory Function

The course concluded with the certificate awarding ceremony on 10.10.2022 at 3 pm in the Seminar hall, IT block. 32 students who registered and attended the classes were given the

certificates in the valedictory function. Dr. Valliappan Raman preceded the ceremony by giving the welcome speech. It was followed by special address by Mr. Arul Praveen who enlightened the students with motivational information. He announced three intern awardees who were selected from the group of participants.



