“Exploring Deep Learning Techniques for Digital Image Processing”

10-08-2024

Online Mode

Sri Sai Ram Engineering College

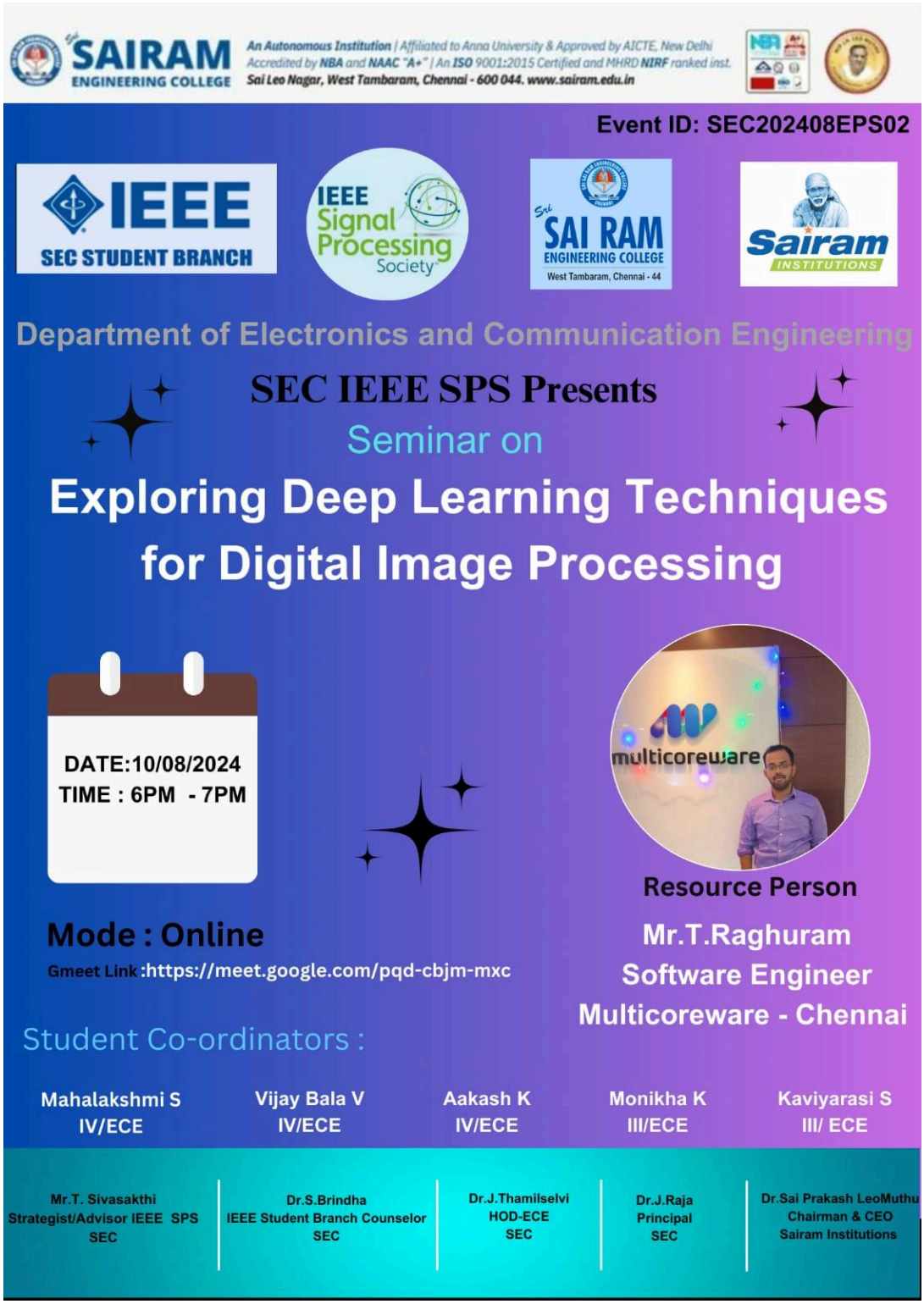
(An Autonomous Institution, Affiliated to Anna University, Chennai)

Chennai-44

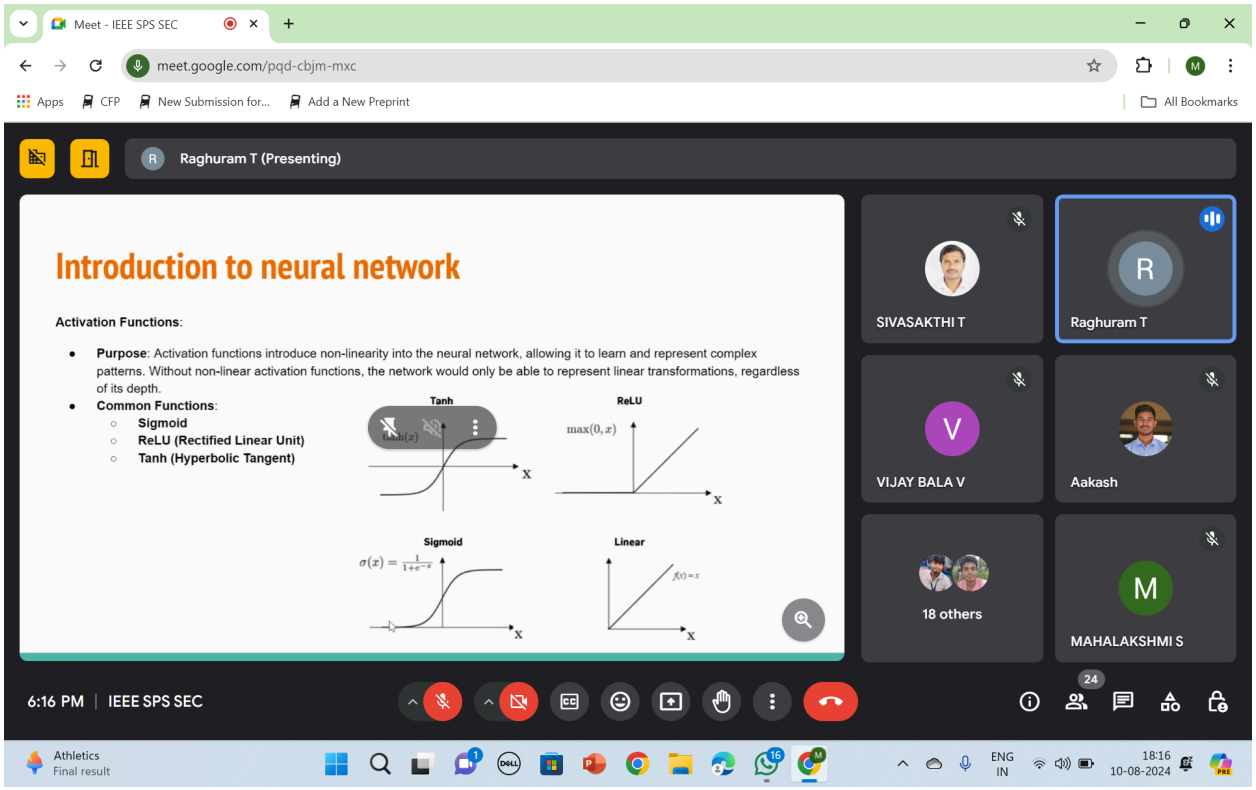
IEEE Signal Processing Society in association with Electrionics and Communication Engineering, Sri Sai Ram Engineering College organized a session on “ Exploring Deep Learning Techniques for Digital Image Processing” on **10th August 2024 from 6:00pm to 7:00pm** through Google Meet platform. The event commenced with warm welcome by Mr T. Sivasakthi (SEC IEEE SPS Advisor). After that speaker Mr. **T.Raghuram- Software Engineer, Multicoreware, Chennai** explained about the various algorithms about deep learning and gave few insights about neural networks, convolutional neural networks the session went on very interesting and interactive.The vote of thanks was given by V.Vijay bala (SEC IEEE SPS Vice Chair).

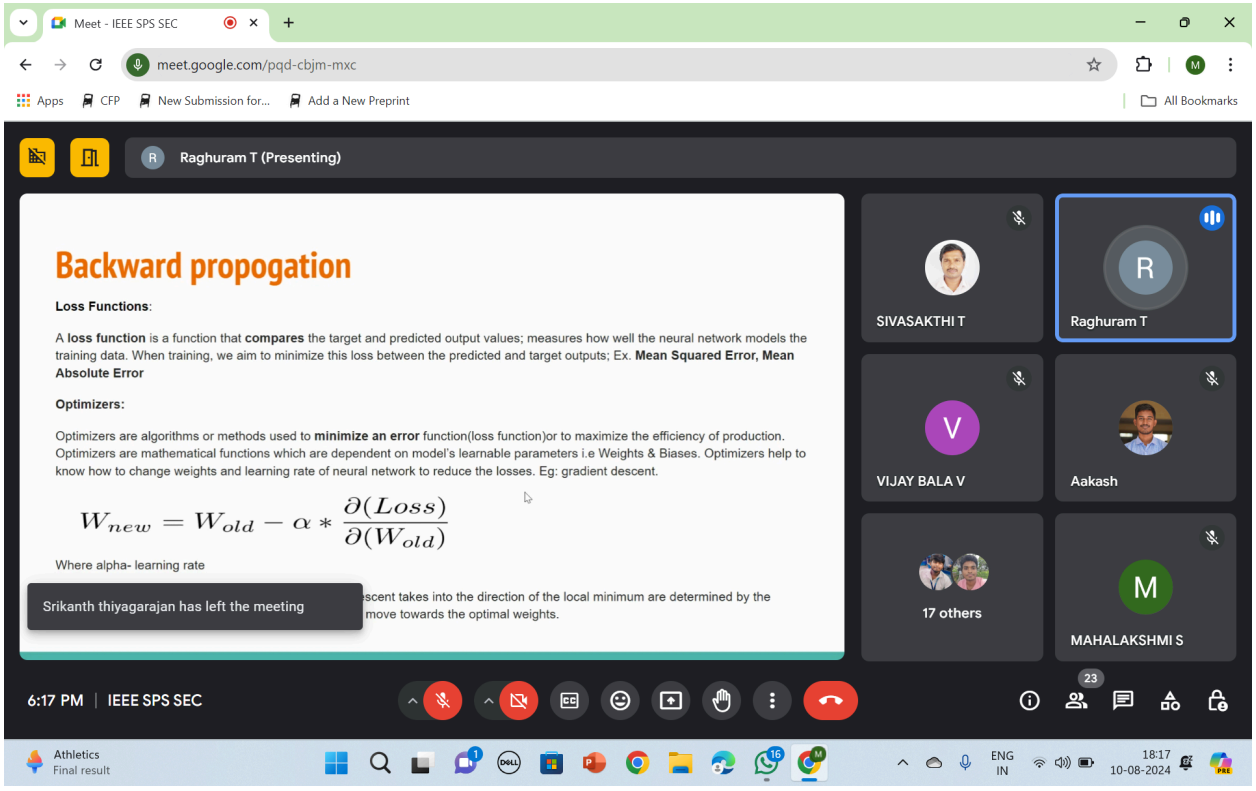
Number of participants: 30

Event Poster:



Event pictures:





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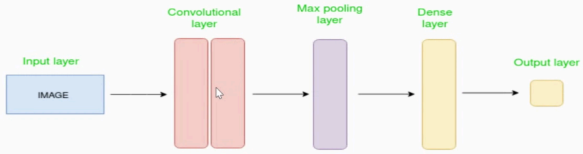
Raghuram T (Presenting)

Convolution Neural Network(CNN)

Convolutional Neural Network (CNN) is the extended version of artificial neural networks (ANN) which is predominantly used to extract the feature from the grid-like matrix dataset. For example visual datasets like images or videos where data patterns play an extensive role.

CNN architecture: Convolutional Neural Network consists of multiple layers like the input layer, Convolutional layer, Pooling layer, and fully connected layers.The Convolutional layer applies filters to the input image to extract features, the Pooling layer downsamples the image to reduce computation, and the fully connected layer makes the final prediction. The network learns the optimal filters through backpropagation and gradient descent.



Raghuram T | SIVASAKTHI T | VIJAY BALA V | Aakash | 20 others | MAHALAKSHMI S

6:24 PM | IEEE SPS SEC

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Raghuram T (Presenting)

Training Deep Learning Models

Data Preparation

- **Image Preprocessing Techniques**:
  - **Normalization**: Scaling pixel values to a standard range (e.g., 0 to 1).
  - **Resizing**: Adjusting image dimensions to match the input size required by the model.
  - **Cropping**: Removing unwanted parts of the image to focus on the region of interest.
  - **Color Space Conversion**: Changing the image color space (e.g., RGB to grayscale).
- **Data Augmentation**:
  - **Purpose**: Increase the diversity of the training dataset and reduce overfitting.
  - **Techniques**:
    - **Rotation**: Rotating the image by a certain angle.
    - **Scaling**: Zooming in or out of the image.
    - **Flipping**: Horizontal or vertical flipping of the image.
    - **Translation**: Shifting the image horizontally or vertically.

Confusion Matrix: A confusion matrix is a performance measurement tool used to evaluate the performance of classification models. It provides a detailed summary of the prediction results by comparing the predicted labels to the actual labels. This matrix is particularly useful for understanding the types of errors made by the model and how well it performs across different classes.

Raghuram T | SIVASAKTHI T | VIJAY BALA V | Aakash | 24 others | MAHALAKSHMI S

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