

# Techno India NJR Institute of Technology, Udaipur

## Advance Deep Learning Using MATLAB

### Training Module

**Total Time: 25 days**

#### MODULE

- Classifying Images with Convolutional Networks
- Interpreting Network Behavior
- Creating Networks
- Training Networks
- Improving Performance
- Spectrogram Classification Project
- Performing Regression
- Using Deep Learning for Computer Vision
- Classifying Sequence Data with Recurrent Networks
- Classifying Categorical Sequences
- Generating Sequences of Output
- Sequence Classification Project
- Conclusion

#### Classifying Images with Convolution Networks

- Course Overview
- Review - Deep Learning Basic

#### Interpreting Network Behaviour

- Extracting and Visualizing Activations
- Visualizing Network Predictions
- Review - Interpreting Network Behaviour

#### Creating Networks

- Training from Scratch
- Course Example - Landcover Classification
- Creating Network Architectures
- Understanding Neural Networks
- Convolutional Layers
- Viewing Filters

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Dr. Pankaj Kumar Porwal  
(Principal)

- Review - Creating Networks

### **Training Networks**

- Understanding Network Training
- Monitoring Training Progress
- Validation
- Review - Training Networks

### **Improving Performance**

- Troubleshooting Methods
- Training Options
- Experiment Manager
- Augmented Datastores
- Review - Improving Performance

### **Spectrogram Classification Project**

- Representing Signal Data as Images
- Project - Classify Spectrograms

### **Performing Regression**

- What is Regression
- Transfer Learning for Regression
- Evaluating a Regression Network
- Review - Performing Regression

### **Using Deep Learning for Computer Vision**

- Computer Vision Applications
- Ground Truth
- YOLO Object Detectors
- Evaluating Object Detectors
- Review - Deep Learning for Computer Vision

### **Classifying Sequence Data with Recurrent Networks**

- Long Short-Term Memory Networks
- Course Example - Classify Musical Instruments
- Structuring Sequence Data
- Sequence Classification
- Improving LSTM Performance
- Review - Classifying Sequence Data with Recurrent Networks

### **Classifying Categorical Sequences**

- Course Example - Author Identification
- Categorical Sequences
- Classify Text Data
- Review - Classifying Categorical Sequences

### **Generating Sequences of Output**

- Sequence-to-Sequence Classification
- Investigate Sequence Scores
- Sequence Forecasting
- Review - Generating Sequences of Output

### **Sequence Classification Project**

- Project - Robot Navigation

### **Conclusion**

- Summary
- Additional Resources
- Survey

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