Artificial Neural Network - Product Catalogue

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Artificial Neural Network Intermediate

Duration - 1 Day / 8 Hours

Program Description

This training program offers a hands-on introduction to Artificial Neural Networks and core machine learning concepts using TensorFlow. Participants will start with building a linear regression model and progressively explore key topics such as activation functions, training-validation loss tracking, and epoch management. The program covers essential regularization techniques like L1, L2, and Dropout to enhance model generalization. Participants will also gain experience with TensorFlow callbacks including EarlyStopping and ModelCheckpoint. Finally, the course includes model evaluation methods and basic hyperparameter tuning for performance optimization.

Learning Goals

❖ Understand the fundamentals of Artificial Neural Networks, including the role and functionality of various activation functions.

❖ Develop and train machine learning models using TensorFlow, starting from simple linear regression to more complex neural networks.

❖ Monitor model performance through training and validation loss tracking, manage epochs effectively, and apply regularization techniques (L1, L2, Dropout) to prevent overfitting.

❖ Implement essential callbacks like EarlyStopping and ModelCheckpoint, evaluate model performance, and perform basic hyperparameter tuning for improved accuracy

Course Topics

❖ Introduction to Artificial Neural Networks & Activation Functions
❖ Linear Regression Model using TensorFlow
❖ Training vs Validation Loss Tracking & Epoch Handling
❖ Regularization Techniques: L1, L2, Dropout
❖ Callbacks: EarlyStopping, ModelCheckpoint
❖ Model Evaluation and Basic Hyperparameter Tuning

Artificial Neural Network Advance

Duration - 1 Day / 8 Hours

Program Description

This training program offers a comprehensive exploration of advanced deep learning techniques and architectures. Participants will learn to build and optimize deep neural networks, including CNNs for image processing and RNNs (LSTM, GRU) for handling sequential data. The program covers transfer learning using popular pre-trained models like VGG16 and ResNet to enhance performance on new tasks. Advanced model tuning strategies and custom training callbacks are introduced to refine model accuracy. Finally, participants will gain insights into model export and deployment using TensorFlow Lite and TensorFlow.js for real-world applications.

Learning Goals

❖ Gain in-depth understanding of advanced neural network architectures including CNNs for image tasks and RNNs (LSTM, GRU) for sequential data processing.

❖ Develop skills in optimization and model tuning techniques such as learning rate scheduling and custom callbacks to improve training performance and accuracy.

❖ Apply transfer learning using pre-trained models like VGG16 and ResNet to accelerate model development and improve performance on new tasks.

❖ Understand the workflow for exporting and deploying models using platforms such as TensorFlow Lite and TensorFlow.js for real-world applications

Course Topics

❖ Deep Neural Networks and Optimization Challenges
❖ Convolutional Neural Networks (CNNs) for Image Processing
❖ Recurrent Neural Networks (RNN, LSTM, GRU) for Sequential Data
❖ Transfer Learning with Pre-trained Models (VGG16, ResNet, etc.)
❖ Advanced Model Tuning: Learning Rate Scheduling, Custom Callbacks
❖ Model Export and Deployment Overview (TF Lite, TF.js)

The modules will be tailored to address UPS-specific supply chain problem statements