

Deep Learning Theory and Practice

HUOFOS

This training covers the foundations of artificial intelligence and machine learning, with special focus on deep learning. Best practices in managing deep learning projects will be shared. Hands-on labs in Python, TensorFlow and Keras will be provided to deepen student understanding.

HPE course number	HUOFOS
Course length	2 Days
Delivery mode	ILT, VILT
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Why HPE Education Services?

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Audience

This course is ideal for data scientists, software developers, solution architects, project managers, researchers and other IT professionals looking to understand deep learning, and to develop and deploy deep learning solutions

Course objectives

At the conclusion of this course, you should be able to:

- Understand general terms and background of deep learning
- Leverage pre-trained deep learning models in image classification, object detection and natural language processing
- Know the best practices in managing deep learning projects
- Get basic understanding on deep learning application development using Python, TensorFlow and Keras

Detailed course outline

Module 1: Deep Learning Introduction

- Terminology
- AI topics and techniques
- Current use of AI
- New frontiers of AI
- Supervised learning
- Unsupervised learning
- Reinforcement learning

Module 2: Artificial Neural Network

- Artificial neuron
- Activation function
- Forward pass and backward pass
- Loss function and gradient descent
- Fully connected neural network
- Convolutional neural network
- Recurrent neural network
- Training and inference

Module 3: Deep Learning Programming Overview

- Python
- NumPy
- Pandas
- TensorFlow
- Keras

Module 4: Pre-trained Models

- Image classification
- Object detection
- Word embedding

Module 5: Regularization

- Underfitting and overfitting
- Bias-variance tradeoff
- Dataset augmentation
- Early stopping
- L1 and L2 regularization
- Dropout
- Adversarial training
- Ensemble method

Module 6: Optimization and Tuning

- Learning rate
- Momentum
- Optimization algorithm
- Parameter initialization strategy
- Data normalization
- Batch normalization
- Hyperparameter tuning strategy
- Hardware acceleration
- HPE Deep Learning Cookbook

Module 7: Deep Learning Project Management

- Deep learning project management
- Data acquisition
- Data preprocessing
- Data labelling
- Baselining
- Data augmentation
- Transfer learning
- Performance measurement
- Ensemble method

Module 8: AI in Law and Ethics

- AI in law
- All in ethics

Module 9: Capstone Project

- Apply deep learning to a real-life use case
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