Course : Deep Learning in practice

Practical course - 3d - 21h00 - Ref. DPL
Price : 2380 CHF E.T.

★★★★☆ 4,4 / 5

Artificial neural networks facilitate machine learning and are revolutionizing many sectors of the economy. During this training course, you will use the most widely used tools in the field to build and train different types of deep neural networks on a variety of datasets.

Teaching objectives

At the end of the training, the participant will be able to:

- ✓ Understand the evolution of neural networks and the reasons behind the current success of deep learning.
- ✓ Use the most popular deep learning libraries
- ✓ Understand the principles of design, diagnostic tools and the effects of different locks and levers
- ✓ Gain practical experience on a number of real-life problems

Intended audience
AI engineers/project managers, AI consultants and anyone wishing to discover deep learning techniques in industrial problem solving.

Prerequisites
Good knowledge of statistics and machine learning, equivalent to that provided by the course "Machine learning, methods and solutions". Experience required.

Course schedule

1 Introduction

- Create a first graph and run it in a session.
- Life cycle of a node's value.
- Handling matrices. Linear regression. Gradient descent.
- Provide data to the training algorithm.
- Save and restore models. View graph and learning curves.

Demonstration
Presentation of machine learning examples in classification and regression.

PARTICIPANTS
AI engineers/project managers, AI consultants and anyone wishing to discover deep learning techniques in industrial problem solving.

PREREQUISITES
Good knowledge of statistics and machine learning, equivalent to that provided by the course "Machine learning, methods and solutions". Experience required.

TRAINER QUALIFICATIONS
The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS
The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.
Participants also complete a placement test before and after the course to measure the skills they've developed.

2 Introduction to artificial neural networks

- Train a PMC (multilayer perceptron) with a high-level TensorFlow API.
- Train a PMC (multilayer perceptron) with basic TensorFlow.
- Fine-tune the hyperparameters of a neural network.

3 Training deep neural networks

- Problems of disappearing and exploding gradients.
- Reuse pre-trained diapers.
- Faster optimizers.
- Avoid over-adjustment with regularization.
- Practical recommendations.

Hands-on work
Implementation of a neural network using the TensorFlow framework.

4 Convolutional neural networks

- The architecture of the visual cortex.
- Convolution layer.
- Pooling layer.
- CNN architectures.

Hands-on work
Implementation of Convolutional Neural Networks (CNN) using a variety of datasets.

5 Deep learning with Keras

- Logistic regression with Keras.
- Perceptron with Keras.
- Convolutional neural networks with Keras.

Hands-on work
Implementation of Keras using a variety of data sets.

6 Recurrent neural networks

- Recurrent neurons. Basic RNR with TensorFlow.
- Training RNR. Deep RNR.
- Long-term memory cell (LSTM). Closed recurrent unit (GRU) cell.
- Automatic natural language processing.

Hands-on work
Implementation of recurrent neural networks (RNN) using a variety of datasets.

TEACHING AIDS AND TECHNICAL RESOURCES

• The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.

• At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.

• A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.

⑦ Autoencoders

- Efficient data representation.
- Principal component analysis (PCA) with a sub-complete linear autoencoder.
- Stacked autoencoders. Unsupervised pre-training.
- Scattered autoencoders. Sparse autoencoders. Variational autoencoders. Other autoencoders.

Hands-on work
Implement autoencoders using a variety of data sets.

Dates and locations

REMOTE CLASS
2026 : 27 Apr., 15 June, 24 Aug., 21 Sep., 4 Nov.