KOENIG
step forward

KOENIG SOLUTIONS · COURSE OUTLINE

Deep Learning: TensorFlow, CNNs & Transformers

Learn to build and train deep neural networks with TensorFlow, applying CNNs, RNNs and transformers to vision, language and sequence tasks.

5 Days	16	30
40 HOURS	MODULES	TOPICS

COURSE OVERVIEW

This course covers deep learning foundations, from neural network basics and shallow and deep architectures through practical aspects such as initialization, regularization and optimization algorithms. It introduces hyperparameter tuning, batch normalization and the TensorFlow framework, along with strategies for structuring machine learning projects. Coverage then moves into convolutional neural networks, including case studies, object detection, face recognition and neural style transfer, before addressing recurrent neural networks, natural language processing, word embeddings, attention mechanisms and transformer networks.

WHO THIS COURSE IS FOR

Data Analyst **Business Analysts** **Data Scientist**

LEARNING OBJECTIVES

- Learn deep learning concepts and architectures
- Develop proficiency in TensorFlow for building and training deep neural networks
- Apply convolutional neural networks (CNNs) to tasks like detection, recognition, and style transfer
- Build and train recurrent neural networks (RNNs) for tasks like natural language processing (NLP) and utilize transformer models for tasks like named entity recognition (NER) and question answering

COURSE SYLLABUS

16 Modules, 30 Topics

01

Introduction to Deep Learning

TOPICS

- Introduction to deep learning trends and applications
- Examples of deep learning applications

02

Neural Network Basics

TOPICS

- Machine learning problem setup and neural network mindset
- Vectorization for efficient computation

03

Shallow Neural Network

TOPICS

- Building a neural network with one hidden layer
- Understanding forward propagation and backpropagation

04

Deep Neural Network

TOPICS

- Computation in deep learning
- Building and training deep neural networks for computer vision tasks

05

Practical Aspects of Deep Learning

TOPICS

- Initialization methods for deep neural networks
- Regularization techniques to prevent overfitting

06

Optimization Algorithms

TOPICS

- Advanced optimization techniques for neural networks
- Random minibatching and learning rate decay

07

Hyperparameter Tuning, Batch Normalization, Frameworks

TOPICS

- Introduction to the TensorFlow framework
- Training neural networks on TensorFlow datasets

08

ML Strategy

TOPICS

- Strategic guidelines for setting goals and managing ML production workflow
- Error analysis procedures

09

Foundations of Convolutional Neural Networks

TOPICS

- Understanding pooling and convolutional layers
- Building deep CNNs for image classification

10

Deep Convolutional Models: Case Studies

TOPICS

- Exploring advanced tricks and methods in deep CNNs
- Applying transfer learning to pretrained models

11

Object Detection

TOPICS

Using CNNs for object detection tasks

12

Face Recognition & Neural Style Transfer

TOPICS

- Applying CNNs for face recognition tasks
- Implementing neural style transfer for art generation

13

Recurrent Neural Networks

TOPICS

- Introduction to recurrent neural networks (RNNs)
- Variants of RNNs for sequential data modeling

14

Natural Language Processing & Word Embeddings

TOPICS

NLP applications with deep learning models · Word embeddings for text analysis

15

Sequence Models & Attention Mechanism

TOPICS

- Enhancing sequence models with attention mechanisms
- Speech recognition and audio data processing

16

Transformer Network

TOPICS

- Understanding the functioning of transformer networks

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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