KOENIG
step forward

KOENIG SOLUTIONS · COURSE OUTLINE

RNNs: LSTM, GRU & Seq2Seq Models

Learn to build and train RNNs, LSTMs, GRUs and Seq2Seq models for text generation, forecasting and translation tasks.

2 Days	10	26
16 HOURS	MODULES	TOPICS

COURSE OVERVIEW

This three day course includes code examples, practical exercises, and links. This will help data scientists learn the theory behind RNNs and gain practical experience in implementing them for various tasks.

WHO THIS COURSE IS FOR

Data Scientists | **Machine Learning Engineers** | **NLP Engineers** | **AI Researchers** | **Data Analysts**

LEARNING OBJECTIVES

- Explain the architecture and working principles of RNNs
- Analyse vanishing and exploding gradient problems in RNN training
- Compare Vanilla RNNs, LSTMs and GRUs for different use cases
- Implement LSTM networks for sequential data tasks
- Implement GRU networks and identify suitable use cases
- Build an RNN model using TensorFlow or Keras
- Develop text generation models at character and word level
- Build Seq2Seq models with attention for translation and chatbots

COURSE SYLLABUS

10 Modules, 26 Topics

01

Introduction to Recurrent Neural Networks

TOPICS

- What are RNNs and their significance in sequential data analysis?
- Basic architecture and working principles of RNNs
- Common use cases for RNNs in data science

02

Understanding Vanishing and Exploding Gradients

TOPICS

- Discuss the challenges of training RNNs, such as vanishing and exploding gradients
- Explore how these issues affect the network's ability to learn long sequences
- Introduce techniques like gradient clipping to mitigate these problems

03

Types of RNNs

TOPICS

- **Introduction to different types of RNN architectures:** Vanilla RNNs, LSTMs, and GRUs
- Explain the advantages and disadvantages of each type
- When to use each type based on specific use cases

04

Long Short-Term Memory (LSTM) Networks

TOPICS

- In-depth exploration of LSTM architecture
- Explain how LSTMs address the vanishing gradient problem
- Real-world applications where LSTMs shine

05

Gated Recurrent Unit (GRU) Networks

TOPICS

- Detailed discussion on GRU architecture and its simplicity compared to LSTMs
- Highlight use cases and scenarios where GRUs are a good choice

06

Building Your First RNN with TensorFlow/Keras

TOPICS

- Hands-on tutorial on creating a simple RNN model using TensorFlow or Keras
- Data preprocessing for sequential data and model evaluation

07

Text Generation with RNNs

TOPICS

- Step-by-step guide on training an RNN to generate text
- Discuss the concept of character-level and word-level text generation
- Tools, libraries, and datasets for text generation projects

08

Sequence-to-Sequence Models with RNNs

TOPICS

- Explore sequence-to-sequence tasks and their applications, like machine translation and chatbots
- How to build Seq2Seq models using RNNs and attention mechanisms

09

Time Series Forecasting with RNNs

TOPICS

- Explain how RNNs can be used for time series forecasting
- Discuss advanced topics like multivariate time series and windowed approaches
- Hands-on example of building a time series forecasting model

10

Advanced RNN Techniques

TOPICS

- Cover advanced RNN techniques such as bidirectional RNNs, stacked RNNs, and attention mechanisms
- Real-world case studies showcasing the impact of these advanced techniques

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.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training | Live Online Classes (ILO) | Fly-Me-A-Trainer (FMAT) | Flexi (Self-Paced) | 1-on-1 Training

Ready to Get Started?

Talk to a learning advisor about schedules, group training and customised delivery.

Visit koenig-solutions.com | info@koenig-solutions.com