

Sequence Models

by DeepLearning.AI

About this Course

In the fifth course of the Deep Learning Specialization, you will become familiar with sequence models and their exciting applications such as speech recognition, music synthesis, chatbots, machine translation, natural language processing (NLP), and more.

By the end, you will be able to build and train Recurrent Neural Networks (RNNs) and commonly-used variants such as GRUs and LSTMs; apply RNNs to Character-level Language Modeling; gain experience with natural language processing and Word Embeddings; and use HuggingFace tokenizers and transformer models to solve different NLP tasks such as NER and Question Answering.

The Deep Learning Specialization is a foundational program that will help you understand the capabilities, challenges, and consequences of deep learning and prepare you to participate in the development of leading-edge AI technology. It provides a pathway for you to take the definitive step in the world of AI by helping you gain the knowledge and skills to level up your career.

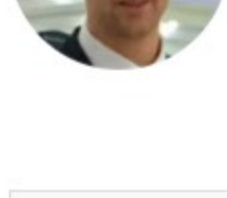
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Taught by:
[Andrew Ng](#), Instructor
Founder, DeepLearning.AI & Co-founder, Coursera



Taught by:
[Kian Katanforoosh](#), Senior Curriculum Developer
Founder, Workera



Taught by:
[Younes Bensouda Mourri](#), Curriculum developer
Computer Science

Basic Info	Course 5 of 5 in the Deep Learning Specialization
Level	Intermediate
Commitment	At the rate of 5 hours a week, it typically takes 5 weeks to complete this course
Language	English, Subtitles: Arabic, French, Bengali, Ukrainian, Chinese (Simplified), Greek, Italian, Portuguese (Brazil), Vietnamese, Dutch, Korean, Oriya, German, Pashto, Urdu, Russian, Thai, Indonesian, Swedish, Turkish, Azerbaijani, Spanish, Dari, Hindi, Japanese, Kazakh, Hungarian, Polish
Hardware Req	There is no hardware requirement
How To Pass	Pass all graded assignments to complete the course.
User Ratings	Average User Rating 4.8

Syllabus

Week 1

Recurrent Neural Networks

Discover recurrent neural networks, a type of model that performs extremely well on temporal data, and several of its variants, including LSTMs, GRUs and Bidirectional RNNs,

12 videos, 5 readings

1. **Video:** [Why Sequence Models?](#)
2. **Video:** Notation
3. **Video:** Recurrent Neural Network Model
4. **Video:** Backpropagation Through Time
5. **Reading:** [IMPORTANT] Have questions, issues or ideas? Join our Forum!
6. **Video:** Different Types of RNNs
7. **Video:** Language Model and Sequence Generation
8. **Video:** Sampling Novel Sequences
9. **Video:** Vanishing Gradients with RNNs
10. **Reading:** Clarifications about Upcoming Gated Recurrent Unit (GRU) Video
11. **Video:** Gated Recurrent Unit (GRU)
12. **Reading:** Clarifications about Upcoming Long Short Term Memory (LSTM) Video
13. **Video:** Long Short Term Memory (LSTM)
14. **Video:** Bidirectional RNN
15. **Video:** Deep RNNs
16. **Reading:** Lecture Notes W1
17. **Reading:** (Optional) Downloading your Notebook, Downloading your Workspace and Refreshing your Workspace

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- Graded:** Recurrent Neural Networks
- Graded:** Building your Recurrent Neural Network - Step by Step
- Graded:** Dinosaur Island-Character-Level Language Modeling
- Graded:** Jazz Improvisation with LSTM

Week 2

Natural Language Processing & Word Embeddings

Natural language processing with deep learning is a powerful combination. Using word vector representations and embedding layers, train recurrent neural networks with outstanding performance across a wide variety of applications, including sentiment analysis, named entity recognition and neural machine translation.

10 videos, 2 readings

1. **Video:** [Word Representation](#)
2. **Video:** Using Word Embeddings
3. **Video:** Properties of Word Embeddings
4. **Video:** Embedding Matrix
5. **Video:** Learning Word Embeddings
6. **Video:** Word2Vec
7. **Video:** Negative Sampling
8. **Reading:** Clarifications about Upcoming GloVe Word Vectors Video
9. **Video:** GloVe Word Vectors
10. **Video:** Sentiment Classification
11. **Video:** Debiasing Word Embeddings
12. **Reading:** Lecture Notes W2

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- Graded:** Natural Language Processing & Word Embeddings
- Graded:** Operations on Word Vectors - Debiasing
- Graded:** Emojiify

Week 3

Sequence Models & Attention Mechanism

Augment your sequence models using an attention mechanism, an algorithm that helps your model decide where to focus its attention given a sequence of inputs. Then, explore speech recognition and how to deal with audio data.

10 videos, 2 readings

1. **Video:** [Basic Models](#)
2. **Video:** Picking the Most Likely Sentence
3. **Video:** Beam Search
4. **Video:** Refinements to Beam Search
5. **Video:** Error Analysis in Beam Search
6. **Video:** Bleu Score (Optional)
7. **Video:** Attention Model Intuition
8. **Reading:** Clarifications about Upcoming Attention Model Video
9. **Video:** Attention Model
10. **Video:** Speech Recognition
11. **Video:** Trigger Word Detection
12. **Reading:** Lecture Notes W3

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- Graded:** Sequence Models & Attention Mechanism
- Graded:** Neural Machine Translation
- Graded:** Trigger Word Detection

Week 4

Transformer Network

5 videos, 5 readings [expand](#)

- Graded:** Transformers
- Graded:** Transformers Architecture with TensorFlow

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How It Works

General

How do I pass?

To earn your Certificate, you'll need to earn a passing

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Programming assignments

Assignments

Graded

Ungraded

Quizzes

Final Exam

Peer Review

Feedback

Help

FAQ

Support

Feedback

Help

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Feedback

Help

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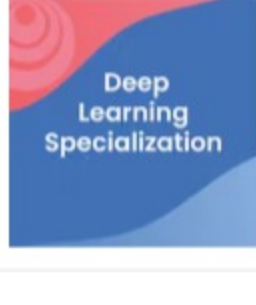
Support

Feedback

Course 5 of Specialization

Become a Machine Learning expert

Master the fundamentals of deep learning and break into AI. Recently updated with cutting-edge techniques!



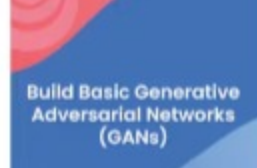
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