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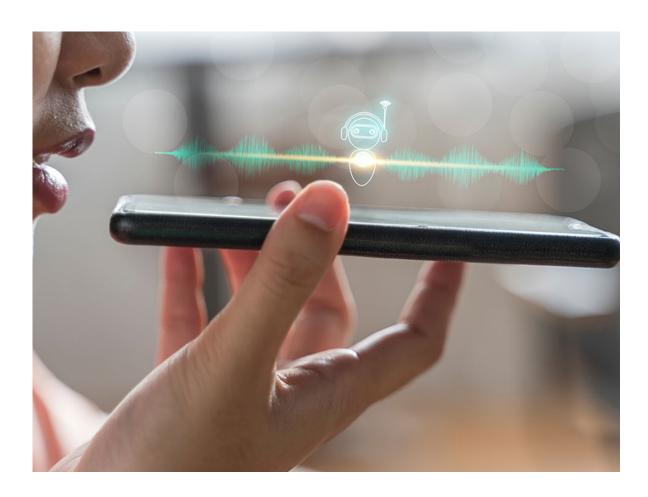
Learning Style: On Demand

Technology:

Difficulty: Beginner

Course Duration: 28 Hours

Natural Language Processing

About this Course:

The field of natural language processing (NLP) is one of the most important and useful application areas of artificial intelligence. NLP is undergoing rapid evolution as new methods and toolsets converge with an ever-expanding availability of data. In this course you will explore the fundamental concepts of NLP and its role in

current and emerging technologies. You will gain a thorough understanding of modern neural network algorithms for the processing of linguistic information. By mastering cutting-edge approaches, you will gain the skills to move from word representation and syntactic processing to designing and implementing complex deep learning models for question answering, machine translation, and other language understanding tasks.

Course Objectives:

- Computational properties of natural languages
- Neural network models for language understanding tasks
- Word vectors, syntactic, and semantic processing
- Coreference, question answering, and machine translation.
- Transformers and pretraining

Prerequisites:

- **Proficiency in Python**: All coding assignments will be written in Python. You should be familiar with numpy and matplotlib, as well as basic shell commands (ssh, scp, ls, cd, rm, mv, cp, zip, etc.).
- **Calculus and Linear Algebra**: You should understand the following concepts from multivariable calculus and linear algebra: chain rule, gradients, matrix multiplication, matrix inverse.
- **Probability**: You should be familiar with basic probability distributions and be able to define the following concepts for both continuous and discrete random variables: Expectation, independence, probability distribution functions, and cumulative distribution functions.
- **Foundations of Machine Learning (Recommended)**: Knowledge of basic machine learning and/or deep learning is helpful, but not required.

Course Outline:

This Course Includes:

- Course Introduction
- Lecture 1: Introduction to NLP
- Lecture 2: N-Grams
- Lecture 3: NLTK
- Lecture 4: Neural Networks in NLP 1
- Lecture 5: Neural Networks in NLP 2
- Lecture 6: RNNS in NLP