

NLP Boot Camp / Hands-on Natural Language Processing - TTAI3030

Explore NLP Essentials: Learn Step By Step How to Prepare Text Data and Develop Deep Learning Models for Your NLP Projects

Duration: 3 Days

Skill Level: Intermediate

Available Format: Instructor-Led Online; Instructor-Led, Onsite In Person ; Blended; On Public Schedule

The Hands-on Natural Language Processing (NLP) Boot Camp is an immersive, three-day course that serves as your guide to building machines that can read and interpret human language.

What You'll Learn

Overview

The Hands-on Natural Language Processing (NLP) Boot Camp is an immersive, three-day course that serves as your guide to building machines that can read and interpret human language. NLP is a unique interdisciplinary field, blending computational linguistics with artificial intelligence to help machines understand, interpret, and generate human language. In an increasingly data-driven world, NLP skills provide a competitive edge, enabling the development of sophisticated projects such as voice assistants, text analyzers, chatbots, and so much more.

Our comprehensive curriculum covers a broad spectrum of NLP topics. Beginning with an introduction to NLP and feature extraction, the course moves to the hands-on development of text classifiers, exploration of web scraping and APIs, before delving into topic modeling, vector representations, text manipulation, and sentiment analysis. Half of your time is dedicated to hands-on labs, where you'll experience the practical

application of your knowledge, from creating pipelines and text classifiers to web scraping and analyzing sentiment. These labs serve as a microcosm of real-world scenarios, equipping you with the skills to efficiently process and analyze text data. Time permitting, you'll also explore modern tools like Python libraries, the OpenAI GPT-3 API, and TensorFlow, using them in a series of engaging exercises.

By the end of the course, you'll have a well-rounded understanding of NLP, and will leave equipped with the practical skills and insights that you can immediately put to use, helping your organization gain valuable insights from text data, streamline business processes, and improve user interactions with automated text-based systems. You'll be able to process and analyze text data effectively, implement advanced text representations, apply machine learning algorithms for text data, and build simple chatbots.

Objectives

This course combines engaging instructor-led presentations and useful demonstrations with valuable hands-on labs and engaging group activities. Throughout the course you'll:

- Master the fundamentals of Natural Language Processing (NLP) and understand how it can help in making sense of text data for valuable insights.
- Develop the ability to transform raw text into a structured format that machines can understand and analyze.
- Discover how to collect data from the web and navigate through semi-structured data, opening up a wealth of data sources for your projects.
- Learn how to implement sentiment analysis and topic modeling to extract meaning from text data and identify trends.
- Gain proficiency in applying machine learning and deep learning techniques to text data for tasks such as classification and prediction.
- Learn to analyze text sentiment, train emotion detectors, and interpret the results, providing a way to gauge public opinion or understand customer feedback.

If your team requires different topics, additional skills or a custom approach, our team will collaborate with you to adjust the course to focus on your specific learning objectives and goals.

Audience

This is an **intermediate and beyond-level** course is geared for experienced Python developers looking to delve into the exciting field of Natural Language Processing. It is ideally suited for roles such as data analysts, data scientists, machine learning engineers, or anyone working with text data and seeking to extract valuable insights from it. If you're in a role where you're tasked with analyzing customer sentiment, building chatbots, or dealing with large volumes of text data, this course will provide you with practical, hands-on skills that you can apply right away.

Pre-Requisites

- Proficiency in Python: As the course involves Python for hands-on labs and examples, attendees should have a good understanding of Python programming, including data structures, control flow, and basic coding practices.
- Basic knowledge of Machine Learning: Understanding the principles of machine learning, including concepts like training and testing splits, model evaluation, and overfitting, will be beneficial.
- Familiarity with Linear Algebra and Statistics: Some fundamental concepts in linear algebra (such as vectors and matrices) and statistics (mean, median, standard deviation, etc.) are essential for understanding the theory behind NLP.
- Experience with any Data Analysis Libraries: Having experience with Python data analysis libraries like Pandas, NumPy, or Matplotlib can be beneficial as they are often used in the preprocessing and analysis of text data.
- General Understanding of Natural Language Processing: While not strictly necessary, having a basic understanding of what NLP is and its potential applications can help attendees contextualize the learnings better.

Take Before: Students should have incoming practical skills aligned with those in the course(s) below, or should have attended the following course(s) as a pre-requisite:

- TTPS4873 Fast Track to Python for Data Science
- TTML5503 Introduction to AI, AI Programming and Machine Learning

Next Steps / Follow-on Courses: We offer a wide variety of follow-on courses and learning paths for Generative AI, AI for Business, GPT, Applied AI, Azure OpenAI, Google BARD, AI for

developers, testers, data analytics, machine learning, deep learning, programming, intelligent automation and many other related topics. Please see our catalog for the current **AI & Machine Learning Courses, Learning Journeys& Skills Roadmaps**, list courses and programs.

TTML5503	Introduction to AI & Machine Learning JumpStart
TTPS4873	Fast Track to Python for Data Science and/or Machine Learning

Agenda

Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We'll work with you to tune this course and level of coverage to target the skills you need most. Topics, agenda and labs are subject to change, and may adjust during live delivery based on audience skill level, interests and participation.

Day 1

Launch into the Universe of Natural Language Processing

- The journey begins: Unravel the layers of NLP
- Navigating through the history of NLP
- Merging paths: Text Analytics and NLP
- Decoding language: Word Sense Disambiguation and Sentence Boundary Detection
- First steps towards an NLP Project

Unleashing the Power of Feature Extraction

- Dive into the vast ocean of Data Types
- Purification process: Cleaning Text Data
- Excavating knowledge: Extracting features from Texts
- Drawing connections: Finding Text Similarity through Feature Extraction

Day 2

Engineer Your Text Classifier

- The new era of Machine Learning and Supervised Learning

- Architecting a Text Classifier
- Constructing efficient workflows: Building Pipelines for NLP Projects
- Ensuring continuity: Saving and Loading Models

Master the Art of Web Scraping and API Usage

- Stepping into the digital world: Introduction to Web Scraping and APIs
- The great heist: Collecting Data by Scraping Web Pages
- Navigating through the maze of Semi-Structured Data

Day 3

Unearth Hidden Themes with Topic Modeling

- Embark on the path of Topic Discovery
- Decoding algorithms: Understanding Topic-Modeling Algorithms
- Dialing the right numbers: Key Input Parameters for LSA Topic Modeling
- Tackling complexity with Hierarchical Dirichlet Process (HDP)

Delving Deep into Vector Representations

- The Geometry of Language: Introduction to Vectors in NLP

Text Manipulation: Generation and Summarization

- Playing the creator: Generating Text with Markov Chains
- Distilling knowledge: Understanding Text Summarization and Key Input Parameters for TextRank
- Peering into the future: Recent Developments in Text Generation and Summarization
- Solving real-world problems: Addressing Challenges in Extractive Summarization

Riding the Wave of Sentiment Analysis

- Unveiling emotions: Introduction to Sentiment Analysis Tools

- Demystifying the Textblob library
- Preparing the canvas: Understanding Data for Sentiment Analysis
- Training your own emotion detectors: Building Sentiment Models

Optional / Bonus Content: Follow On

Optional: Capstone Project

- Apply the skills learned throughout the course.
- Define the problem and gather the data.
- Conduct exploratory data analysis for text data.
- Carry out preprocessing and feature extraction.
- Select and train a model. • Evaluate the model and interpret the results.
- Lab: Complete a capstone project where students tackle a real-world NLP problem from start to finish. (1 hour)
- Tools Used: Python, Various Python Libraries (based on project needs)

Bonus Chapter: Generative AI and NLP

- Introduction to Generative AI and its role in NLP.
- Overview of Generative Pretrained Transformer (GPT) models.
- Using GPT models for text generation and completion.
- Applying GPT models for improving autocomplete features.
- Use cases of GPT in question answering systems and chatbots.
- Lab: Implementing a text completion application using GPT-3.
- Tools Used: Python, OpenAI GPT-3 API

Bonus Chapter: Advanced Applications of NLP with GPT

- Fine-tuning GPT models for specific NLP tasks.
- Using GPT for sentiment analysis and text classification.
- Role of GPT in Named Entity Recognition (NER).
- Application of GPT in developing advanced chatbots.
- Ethics and limitations of GPT and generative AI technologies.
- Lab: Fine-tuning GPT-3 for a specific NLP task.

- Tools Used: Python, OpenAI GPT-3 API, TensorFlow

All applicable course software, digital courseware files or course notes, labs, data sets and solutions, live coaching support channels and rich extended learning and post training resources are provided for you in our “easy access, no install required” online **Learning Experience Platform (LXP)**, remote lab and content environment. Access periods vary by course. We’ll collaborate with you to ensure your team is set up and ready to go well in advance of the class. Please inquire about set up details and options for your specific course of interest.

For More Information

Please [contact us](#) or call 844-475-4559 toll free for more information about our training services (instructor-led, self-paced or blended), coaching and mentoring services, public course enrollment or questions, partner programs, courseware licensing options and more.