**Fundamentals of Deep Learning**

**Title: Fundamentals of Deep Learning**

**Duration:** 1 day

**Pre-requisite:** Basic Python Programming

**Short Description:**

This Fundamentals of Deep Learning class will provide you with a solid understanding of the technology that is the foundation of artificial intelligence. We will explore deep neural networks and discuss why and how they learn so well.

**Long Description:**

This Fundamentals of Deep Learning class will provide you with a solid understanding of the technology that is the foundation of artificial intelligence. We will explore deep neural networks and discuss why and how they learn so well.

We will begin with understanding the context of deep learning and its relationship to machine learning and artificial intelligence. We’ll then examine shallow neural networks in order to better understand the advantages of deep neural networks, which enable deep learning. Specifically, we’ll delve into Convolutional Neural Networks and Recurrent Neural Networks, and explore uses cases for each. We will use Keras and TensorFlow as our tools to apply deep learning on real-world datasets. We’ll look at some of the amazing things that deep learning can do and how to spot opportunities for deep learning.

**Learning Objectives:**

After this course, you will be able to:

* Install Anaconda on a personal computer.
* Install TensorFlow
* Understand deep learning in the context of machine learning and AI
* Understand neural networks
* Understand the architectural differences between shallow and deep neural networks
* Understand deep Convolutional and Recurrent Neural Networks
* Use Pandas to work with unstructured data
* Use Scikit-learn to evaluate model performance
* Understand use cases for Convolutional Neural Networks
* Understand use cases for Recurrent Neural Networks
* Understand the relationship between TensorFlow and Keras for applying deep learning

**Topic Outline:**

* Course Introduction
* Overview of artificial intelligence
* Install Anaconda
* Milestone 1: Learn how to use Jupyter Notebooks
* Essential libraries
  + TensorFlow
  + Keras
  + Pandas
  + Scikit-learn
* Neural networks
* Deep learning
* Convolutional Neural Networks
  + Architecture
  + Use cases
* Recurrent Neural Networks
  + Architecture
  + Use cases
* Milestone 2: Work with unstructured data using Pandas
* Milestone 3: Apply deep learning using Keras/TensorFlow
* Conclusion: Deep Learning opportunities, next steps

**Structured Activity/Exercises/Case Studies:**

* Milestone Project 1: Install and setup Anaconda/Jupyter Notebooks
* Milestone Project 2: Work with unstructured data using Pandas
* Milestone Project 3: Apply deep learning using Keras/TensorFlow
* **Training material provided:** Yes (Digital format)