Specialised Programme on Artificial Intelligence – 2 Weeks

Pre-requisite

- Good knowledge of Python Programming and Basics of Machine Learning

Aim

- Explore core concepts of neural networks and deep learning through detailed case studies.
- Learn to develop and apply neural network components and leverage deep learning techniques on real-world datasets using modern libraries and frameworks.
- Gain hands-on experience with the latest AI computing platforms to build efficient and scalable systems.
- Understand current trends and applications in AI to streamline and automate processes effectively.
- Combine theoretical foundations with practical skills for designing, developing, and implementing AI-based solutions.

Objectives

- Acquire comprehensive knowledge of contemporary AI methodologies and their practical applications in various fields.
- Design, implement and apply novel AI techniques based on emerging real-world requirements.
- Introduce major deep learning algorithms, the problem settings and their applications to solve real-world problems.
- Gain insights into key challenges in data science and deep learning, including data handling, model selection, and managing complexity.
- Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.
- Implement recurrent neural networks in Python using the PyTorch and TensorFlow libraries and train them with real-world datasets.

Course Contents

Fundamental of Artificial Intelligence

Why AI Now? Revolution of AI, Philosophies of CS & Real-world Implications, Revolution & Current Trends in AI, Applications in various Domains, Supervised & Unsupervised Learning, Types of Search Methodologies, Uninformed Search Algorithms.

Deep Neural Network

Introduction to Advanced packages in Python based on deep learning
Neural Network and its applications, Single layer neural Network, Constructing Neural
Networks model, constructing nodes, Creating weight connections between the nodes
Overview of Feed Forward Neural Network, Backpropagation, Activation Functions: Sigmoid, Hyperbolic Tangent, Training deep neural network, building deep learning models, building a basic neural network using Keras with Tensor Flow.

AI Trends and Computing Platforms

Introduction to Version control systems, Creating GitHub repository, Using Git – Introduction to
git commands. Introduction to DevOps containers: Advantages of using container-based applications, installing docker and using basic docker commands, Build your container-based application image.

Flagship Scheme of Government of India Under Artificial Intelligence

Centre of Excellence (CoEs) in Artificial Intelligence