

# ACCREDITED

# HANDS ON TRAINING PROGRAM ON AI, MAGHINE LEARNING, COMPUTER VISION, DEEP LEARNING AND NVIDIA DGX100 SUPERCOMPUTER

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Centre for Artificial Intelligence in Medicine, Imaging & Forensics (CAIMIF) Starting from 01<sup>st</sup> Feb to 03<sup>rd</sup> May 2025 (40 Hrs Total) The "AI, Machine Learning, Computer Vision, Deep Learning and Nvidia DGX100 Supercomputer" training program is designed to empower participants with the essential skills and knowledge needed to excel in the fields of programming and artificial intelligence. This program offers a comprehensive introduction to Python, covering foundational concepts and practical coding techniques. Participants will also explore key AI, machine learning and deep learning principles, learning how to implement and apply these techniques to real-world problems. Through hands-on projects and guided exercises, attendees will gain practical experience in developing and deploying AI/ML models, equipping them with the tools to navigate the rapidly evolving tech landscape.

# **Objectives**

• **Foundational Python Skills:** Equip participants with a solid understanding of Python programming basics, including data types, control structures, functions, and libraries, to ensure they can write and debug simple Python scripts. Exploratory Data Analysis: Understanding various types of data, techniques for pre-processing the data and visualizing the data using Matplotlib and Seaborn libraries and implementing statistical functions on data using python.

• Machine Learning Foundations and Advanced Concepts: Provide an overview of key AI/ML concepts, such as supervised and unsupervised learning, model evaluation metrics, and common algorithms Linear and Logistic Regression, decision trees, random forests, support vector machines, K-means Clustering, Concept of dimensionality reduction and ensemble techniques

• **Practical Application of AI/ML Techniques:** Enable participants to apply AI/ML techniques using Python libraries (e.g., NumPy, Pandas, Scikit-learn, TensorFlow) to solve real-world problems, including data preprocessing, model training, and evaluation.

• **Deep Learning Foundations and Advanced:** Demonstrating neural networks using feedforward neural networks and backpropagation algorithm, understanding activation and cost functions, using artificial neural networks for regression and classification. Understanding and using Convolution neural networks for image classifications.

• Hands-on Project Development: Guide participants through developing and deploying a simple Machine Learning (ML) project, from problem definition and data collection to model implementation and performance optimization, fostering practical experience and problem-solving skills.

• Working with Nvidia DGX100: Introducing Nvidia DGX100 server, docker containers and Kubeflow notebooks to the participants and enabling participants to train AI models on it.

### Schedule and Course Details

## Timing: 10:00 AM – 4:00 PM (Working Saturdays)

working with Julyter Notebooks and Google Cabb         (1000-100)           • Working with Strings         • Working with Strings           15/02/2025         Saturdey         Data Spes, Loga and Conditional Statements           • Working with Strings         • Using With Strings           • Functions         • Introduction to Numpy module, Numpy Arrays and their manipulation, Numpy Functions           • Pinds Stata Frames and Herr manipulation         • Introduction to Numpy module, Numpy Arrays and Herr manipulation, Numpy Functions           • Pinds Stata Frames and Herr manipulation         • Data Manipulation using Numpy and Pandas (using a case study)         (200-400)           01/03/2025         Saturdey         Exploratory Data Analysisis         (1000-1100)           • Types of Data         • Data Preprocessing and Feature Selection         (200-400)           • Scaling and Nomalizing data         • Data Preprocessing and Feature Selection         (200-400)           • Scaling and Nomalizing data         • Introduction to Artifici Response.         Sins for the selection on the selection status of the selection on the selection status of the selection on the selection status of the selection status of the selection on the selection status of the selection on the selection status of the selection status of the selection on the selection on the selection status of the selection	Date	Day	Lecture Topic	Hours		
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- bits typics. Loop and Conditional Statements     (2300-4300)       - Orion built in data structures. Luts Tuples, Dictionalies and sets - working with strugs     Shree       15/02/2025     Saturday     Saturday     Shrees       - Introduction to Numpy module, Numpy Arrays and their manipulation, Numpy Functions, - Brands Data Types (Series and dataframes) - Brands Data Types (Series and Adarfames) - Brands Data Types (Series and Machine Learning Foundations and Advanced)     Shrs (10:00-1:00) (2:00-4:00)       08/03/2025     Saturday     Machine Learning Foundations - Graduction to Afficial Intelligence and Machine Learning. Deep Learning - Introduction Supervised, Unsupervised and Beinforcement Learning. Deep Learning - Introduction - Graducin Math, Presion, Reall, FLScore, ROC Curve, Classification report - Bradictions, Model Accuracy, Graphical Pitting - Graduction text, Presion, Reall, FLScore, ROC Curve, Classification report - Bradiction and prediction using decision trees and Random Torest for - Bradiction and prediction using decision trees and Random Torest for - Bradiction and Prediction using decision trees and Random Torest for - Bradiction and Prediction using decision trees and Random Torest for - Bradiction and Introduction to Neural Networks - Time Series - Introduction t			5 , 5	(10:00-1:00)		
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15/02/2025       Saturday       Data Manipulation with NumPy and Pandas: <ul> <li>Introduction to Numpy Module, Numpy Arrays and their manipulation, Numpy Functions <ul></ul></li></ul>						
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9     - Pandas DataFrames and their manipulation - Data Manipulation using Numpy and Pandas (using a case study)     Shrs       01/03/2022     Saturday     Exploratory Data Analysis: - Data Pre-processing and Feature Selection - Data Visualization using natipotith and seaborn - Implementation of Basic Statistics methods     Shrs       08/03/2023     Saturday     Machine Learning Foundations - Implementation of Basic Statistics methods     Shrs       08/03/2025     Saturday     Machine Learning Foundations - Implementation and regularizations - Confusion and regularizations - Gradient Descent Higgorith, Parameters & Hyper parameters, R Squared & Adj, Squared, Model, Cost Function and regularizations - Gradient Descent Higgorith, Parameters & Hyper parameters, R Squared & Adj, Squared, - Model Picelictions, Model Accuracy, Graphical Plotting - Concept of Legistic Regression Environ Forest: Example problem - Confusion Matrix, Precision, Recall, F1-Score, NOC Curve, Classification neport - Confusion Matrix, Precision, Recall, F1-Score, NOC Curve, Classification neport - Confusion Matrix, Precision, Recall, F1-Score, NOC Curve, Classification report - Confusion Matrix, Medichico: Concepts of Decision Trees and Random forest: Example problem - Confusion Matrix, Medichico: Concepts and need for dimensionality reduction, PCA, LDA - Unsupervised Learning: Clustering Introduction, K-Means Clustering: Concept and - Working Principle - Support Vector Machines - Time Series - Introduction, Tc-Maans Advanced and Nvidia DGX1000     (10:00-1:00) (2:00-4:00)       55/04/2025     Saturday     Computer Vision and Introduction, Colur filtering on Image, Image Contour - Feature Extraction, Cascade Classifier and HaarCascade - Frontal Face & Eyr Deleatrioning Hourowsking, Single Layer Perceptron Model, - Mutilayer				(2:00-4:00)		
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01/03/2025     Saturday     Exploratory Data Analysis: (19:00-1:00) (2:00-4:00)         (2:00						
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00/00/2023       Saturday <ul> <li>Introduction to Artificial Intelligence and Machine Learning, Deep Learning – Introduction Supervised, Luxspervised and Reinforcement Learning, Deep Learning – Introduction Supervised, Luxspervised and Reinforcement Learning Concept of Logistic Regression: Binary Logistic Regression, Example Problem Concept of Logistic Regression: Binary Logistic Regression, Example Problem Concept of Logistic Regression: Binary Logistic Regression, Example Problem Concept of Logistic Regression: Binary Logistic Regression, Example Problem</li> <li>Consent of Logistic Regression: Binary Logistic Regression, Example Problem</li> <li>Consent of Logistic Regression: Binary Logistic Regression, Example Problem</li> <li>Consent of Logistic Regression: Binary Logistic Regression, Example Problem</li> <li>Consent of Logistic Regression: Binary Logistic Regression, Example Problem</li> <li>Consent of Logistic Regression: Binary Logistic Regression, Example Problem</li> <li>Consent of Logistic Regression: Concepts of Decision Trees and Random Forest: Example problem</li> <li>Dimensionality Reduction: Concept and need for dimensionality reduction, PCA, LDA Unsupervised Learning: Clustering Introduction, K-Means Clustering: Concept and working Principle</li> <li>Support Vector Machines</li> <li>Time Series – Introduction Techniques and applications, Components of Time Series Forecasting, ARIMA Model</li> <li>Advanced Ensemble Learning: Bugging, Boosting, Adaboost, Xgboost</li> <li>Modele 3 (Deep Learning Foundations and Advanced and Nvidia DGX100)</li> <li>Shars (10:00-1:00)</li> <li>Introduction to Neural Networks</li> <li>Introduction to Neural Networks</li> <li>Introduction Neural Networks</li> <li>Introduction Neural Networks&lt;</li></ul>						
Supervised, Unsupervised and Reinforcement Learning       (10:00-10)         Pinear Regression: Regression Problem Analysis, Mathematical modelling of Regression Model, Cost Function and regularizations       (2:00-4:00)         Concept of Logistic Regression: Binary Logistic Regression, Example Problem       (2:00-4:00)         Contissin Matrix, Precision, Reall, F1-Score, ROC Curve, Classification report       (2:00-4:00)         29/03/2025       Saturday       Machine Learning Advanced       (2:00-4:00)         29/03/2025       Saturday       Machine Learning Advanced       (2:00-4:00)         29/03/2025       Saturday       Obmensionality Reduction: Concept and need for dimensionality reduction, PCA, LDA overking Principle       (2:00-4:00)         29/03/2025       Saturday       Computer Vision and Introduction, Techniques and applications, Components of Time Series - Forecasting, ARIMA Model       (2:00-4:00)         29/04/2025       Saturday       Computer Vision and Introduction to Neural Networks       Shrs (10:00-1:00)         05/04/2025       Saturday       Computer Vision and Introduction to Neural Networks       Shrs (10:00-1:00)         05/04/2025       Saturday       Computer Vision and Introduction to Neural Networks       Shrs (10:00-1:00)         05/04/2025       Saturday       Computer Vision and Introduction to Neural Networks       Shrs (10:00-1:00)         05/04/2025       Saturday	08/03/2025	Saturday				
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Model, Cost Function and regularizations       Gradient Descent Algorithm, Parameters & Hyper parameters, R Squared & Adji, Squared, Model Predictions, Model Accuracy, Graphical Plotting       Concurse of Logistic Regression, Example Problem         Contrusion Matrix, Precision, Recall, F1-Score, ROC Curve, Classification report       Decision Trees and Random Forest: Concepts of Decision Tress and Random forest for classification       Shrs         29/03/2025       Saturday       Machine Learning Advanced       Shrs         29/03/2025       Saturday       Machine Learning: Clustering Introduction, K-Means Clustering: Concept and working Principle       Shrs         29/03/2025       Saturday       Computer Vision and Introduction, Techniques and applications, Components of Time Series Forecasting, ARIMA Model       Shrs         05/04/2025       Saturday       Computer Vision and Introduction to Neural Networks - Introduction to OpenCV       Shrs         11/04/2025       Saturday       Computer Vision and Introduction to Neural Networks - Foreface Cluster and HaarCascade - Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade - Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade - Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade - Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade - Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade - Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade - Frontal Face & Eye Detection using Contur - Regression with ANN: Learning Algorithm - Activation Functions - Consolution Repural Networks and Backpropag				(2:00-4:00)		
<ul> <li>Model Predictions, Model Accuracy, Graphical Plotting</li> <li>Concept of Logistic Regression: Binary Logistic Regression, Example Problem</li> <li>Contusion Matrix, Precision, Recall, F1-Score, ROC Curve, Classification report</li> <li>Decision Trees and Random Forest: Concepts of Decision Tress and Random forest for classification</li> <li>Classification and prediction using decision trees and random forest: Example problem</li> <li>Machine Learning AdVanced</li> <li>Dimensionality Reduction: Concept and need for dimensionality reduction, PCA, LDA</li> <li>Unsupervised Learning: Clustering Introduction, K-Means Clustering: Concept and working Principle</li> <li>Support Vector Machines</li> <li>Time Series – Introduction, Techniques and applications, Components of Time Series Forecasting, ARIMA Model</li> <li>Advanced Ensemble Learning: Boging, Boosting, Adaboost, Xgboost</li> <li>Module 3 (Deep Learning Foundations and Advanced and Nividia DGX100)</li> <li>Image Processing: Working &amp; implementation with Image, Edge Detection &amp; smoothing of Image, Working With resolution, Colour filtering on Image, Image Contour</li> <li>Feature Extraction, Cascade Classifier and HaarCascade</li> <li>Frontal Face &amp; Eye Detection using CV2 (Computer Vision) and Haar Cascade Introduction to Neural Networks.</li> <li>Artificial Neural Network: ANN: ANN &amp; Working, Single Layer Perceptron Model, Multilayer Neural Networks</li> <li>Artificial Neural Networks: CNNVs Human Brain</li> <li>Consolution Applying Gradient Descent Algorithm.</li> <li>Consolution application operation, Padding, Stride, Filters/Romely, Pooling, Flattenning</li> <li>Deep Learning Foundations and Advanced</li> <li>Regression with ANN: Learning Algorithm</li> <li>Convolution operation, Padding, Stride, Filters/Romely, Pooling, Flattenning</li> <li>Deploying convolutional neural networks of Thess Case</li> <li>Introduction to Disker Containers and Kubeflow Not</li></ul>			Model, Cost Function and regularizations			
9       • Concept of Logistic Regression: Binary Logistic Regression, Example Problem         • Confusion Matrix, Precision, Recall, F1-Score, ROC Curve, Classification report       • Decision Trees and Random Forest: Concepts of Decision Tress and Random forest for classification and prediction using decision trees and random forest: Example problem         29/03/2025       Saturday       Machine Learning Advanced       • Shrs         29/03/2025       Saturday       Machine Learning Advanced       • Dimensionality Reduction: Concept and need for dimensionality reduction, PCA, LDA       (10:00-1:00)         • Unsupervised Learning: Clustering Introduction, K-Means Clustering: Concept and working Principle       • Support Vector Machines       • Time Series - Introduction, Techniques and applications, Components of Time Series - Forecasting, ARIMA Model         • Advanced Ensemble Learning: Bagging, Boosting, Adaboost, Xgboost       Module 3 (Deep Learning Foundations and Advanced and Nvidia DGX100)         05/04/2025       Saturday       Computer Vision and Introduction to Neural Networks       • Introduction to OpenCV       Introduction to OpenCV         • Introduction to OpenCV       • Introduction to Neural Networks       • Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade Introduction to Neural Networks       • Artificial Neural Networks         • Frontal Face & Eye Detection using CV2 (Computer Vision) and Haar Cascade Introduction to Neural Networks and Advanced       • Artificial Neural Networks       • Feeedforward Neural Network						
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Introduction to Docker Containers and Kubeflow Notebooks     Al Model Training and Analytics	03/05/2025	Saturday				
Al Model Training and Analytics						
Total 10				(2.00 7.00)		
			Total	40		

#### Registration Link https://forms.gle/Gor6TX2kJ2o9qHmj7

#### Payment Link/UPI

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#### **FEE STRUCTURE**

Module 1 (Data Analysis Fundamentals with Python)	1500
Module 2 (Machine Learning Foundations and Advanced)	1500
Module 3 (Deep Learning Foundations and Advanced) and	1500
Introducing Nvidia DGX100	
Module 1,2 and 3	4000

#### NOTE: Certificates will be issued for each module separately

#### Course Instructors from Center for AI in Medicine, Imaging & Forensics (CAIMIF)



Prof.(Dr.) Vasudha Arora Professor CSE, SSET & member CAIMIF



Convener Prof.Ashok Kumar Head, Center for AI in Medicine, Imaging & Forensics Sharda University



Dr. Shree Harsh Attri Associate Professor CSE, SSET & member CAIMIF



Coordinator Ms. Bushra Khan Assistant Professor SAHS & coordinator CAIMIF

Lecture Time: 10:00AM to 1:00PM(OFFLINE), 2:00PM to 4:00 PM (Offline)

Venue : Center for Artificial Intelligence in Medicine, Imaging and Forensics Room 103 B, Block 2, Sharda University