Defence Institute of Advanced Technology
An Autonomous Organization
funded by
Department of Defence Research & Development,
Ministry of Defence, Government of India

DIAT CERTIFIED ARTIFICIAL INTELLIGENCE PROFESSIONAL

An Online Training & Certification Programme by
Defence Institute of Advanced Technology (DIAT)

Genesis of the Course

AI is being elevated constantly for some time and being considered as revolution in the whole IT field. There is a strong need for AI professionals who are skilled to deliver state-of-the-art AI solutions. The objective of the course is to impart the essential knowledge of AI and ML to serve the needs of multidisciplinary research ongoing in different research labs and industries in the country.

Structure of the Course

The training and certification course is a 12 weeks online course offering a mix between fundamentals and advanced topics of AI & ML such as Probability Theory, Pattern recognition, Big Data Analytics, Computer Vision, Natural Language Processing, Augmented Reality, Deep Learning and related advancements in the domain. Syllabus is designed by leading academicians and AI experts from DRDO.

Online mode of course.
Learn from anywhere, without leaving your home or your job.

Certificate

The entrance test ensures the qualification for enrolling in the course.
DIAT Certified Artificial Intelligence Professional will be awarded after successful completion, to claim your state-of-the-art skill set.

Target Audience

Graduates from any discipline aiming for successful career in Artificial Intelligence and Machine Learning. IT professionals who wish to enhance their AI skills, Officers from Tri-services, R&D professionals, or anyone who wants to develop the expertise in the field of AI.

Eligibility

Graduate from any discipline. Students from final year may apply. Need to qualify the entrance test.

Be prepared to learn the advanced skills and sharpen your edge.

Prerequisite for the course - Syllabus for Entrance Test

- Modular Mathematics, Statistics, Probability theory
- Basics of Algorithms, Databases, Data structures
- Knowledge of any Programming Language

Fees Details

- Fees for Entrance Test: **Free**
- Fees for the Course: **Rs. 17,700/- (including GST @18%)**
  [Need to be paid after qualifying the Entrance Test]

Important Dates

- Registration for Test: **28th Jan 2021 to 15th Feb 2021**
  [Link: onlinecourse.diat.ac.in]
- Date of Entrance Test: **20th Feb 2021, [Time:**15.00-16.00 hrs]
- Date of Result Declaration: **22nd Feb 2021**
- Last date of payment of fees: **26th Feb 2021** [After qualifying]
- Date of Commencement: **28th Feb 2021**

Duration

12 weeks online course,
120 contact hours
[2 hours/day & 5 days/week]

Advisors

- **Dr. CP Ramanarayanan, VC, DIAT**
- **Dr. Subrata Rakshit ,DRDO**
- **Prof. KP Ray, DIAT**
- **Shri. Shailesh Chandsarkar, DRDO**

Trainers

The training sessions are offered by the leading academicians, experts from DRDO, national and international AI professionals from industry and AI think tank.

For information

Contact: **ai@diat.ac.in;** Website: **onlinecourse.diat.ac.in**; http://diat.ac.in;

Course framework

1) Probability Theory and Pattern Recognition (2 weeks)
2) Machine Learning & Deep Learning (2 weeks)
3) Computer Vision (2 weeks)
4) Big Data Analysis and Algorithms (2 weeks)
5) Augmented Reality (2 weeks)
6) Natural Language Processing (2 weeks)

Syllabus Details

Probability Theory and Pattern Recognition: Basic probability and measures of dispersion, Random Variable, Probability function and Joint probability function
Binomial and Poisson distribution, Normal distribution, Application to learning using Bayesian method, Introduction to Pattern Recognition Systems, Classification, Types of Classification, Linear and Non-Linear Classification, Dimensionality Reduction & Feature Selection Methods: Linear Discriminant Analysis and Principal Component Analysis, Introduction to Clustering, Algorithms: Distance Based Clustering: Distance based and Density based, Predictive Modelling, Case Studies.

Machine Learning & Deep Learning : Introduction to AI, ML & Deep learning, Methods and Concepts for AI & ML, Artificial Neural Networks: Basics of Neuron, Perceptron, Multilayer Neural Network, Back-propagation Algorithm; Introduction to Deep Neural Networks, Convolutional Neural Networks, Image Classification using CNN, Recurrent Neural Networks & Auto-encoders, Generative Adversarial Networks (GANs).

Computer Vision: Introduction to Image processing techniques; Images, Noise, Convolution, Filtering; Thresholding techniques, Image segmentation; Edge Detection techniques, Interest Point Detection, Harris Corner Detector, SIFT, Histograms of Oriented Gradients; Binary shape analysis, connectedness, object labelling and counting; Boundary tracking procedures, active contours; Boundary descriptors, chain codes, Fourier descriptors, region descriptors, moments ; Hough Transform; Optical Flow, Motion Models, Global Motion , KLT Tracking, Mean-Shift Tracking; Deep Sort; Camera Model and Calibration; Fundamental Matrix, Stereo Images; 3 D Image processing; Face Recognition based on video; Human activity detection based on video; Medical Image Segmentation.

Big Data Analysis and Algorithms: Big data & Demo Hadoop-I, Hadoop Ecosystem & Demo Hadoop-II, HDFS and YARN with Demo on Spark HDFS, MapReduce with Demo on HDFS Part I, DS in MapReduce with Demo on YARN Part I ,Hive- Part I with Demo on MapReduce Part I , Hive-Part II with Hive Demo, Types of Data Formats and Case study.

Augmented Reality: Background, Motivation, Introduction, Software/Hardware, Geometry of Models, Visual Perception, Visual Rendering, Tracking Algorithms AR Tutorial for Android Devices, Motion in Real and Virtual Worlds, Application Design and development, Labs on AR/VR Hardware & Software, AR/VR Tutorial for Android devices and Google Cardboard, Unity3d Vuforia, ARkit, AR/VR Game Development, Virtual Tour creation.

Natural Language Processing: Word discovery from real situations, Aligning unsupervised syntax with sensory structures, Machine Translation, Knowledge Discovery Graphs, NELL (Never Ending Language Learning), Case-Studies etc.