



ARTIFICIAL INTELLIGENCE
& MACHINE LEARNING



POST[↑]
GRADUATE
PROGRAM IN

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING



TEXAS McCombs
The University of Texas at Austin
McCombs School of Business





AI - THE NEXT DIGITAL FRONTIER

60%

Rise In Demand for Artificial Intelligence and Machine Learning experts

Source: Kelly OCG

\$40 BILLION

was spent by companies around the world in developing AI capabilities

Source: McKinsey Global Institute report on Artificial Intelligence

40%

Of Digital Transformation initiatives will use AI services by 2019 and by 2021, 75% of enterprise applications will use AI

Source: IDC report 2018

75%

of Indian companies feel that the shortage of skilled professionals is slowing down their adoption of AI

Source: Intel/IDC

GREAT LEARNING⁷

INDIA'S LEADING PROFESSIONAL
LEARNING COMPANY

20

Top-ranked programs

400+

Hiring Companies

160+

Countries

750,000

Successful Learners

2000+

Faculty



PROGRAMS AT A GLANCE⁷

PGP-AIML - Artificial Intelligence & Machine Learning	
Duration	12 months
Formats	<ul style="list-style-type: none">◦ Blended (Weekend classroom & Online content)*◦ Online only (Online content with weekend personalised mentoring)
Suitable for	Professionals with 3+ years of experience in a technology role, including some programming knowledge preferably in Python. This program helps develop competence in Artificial Intelligence and Machine Learning for future-oriented working professionals.

PGP-ML - Machine Learning	
Duration	7 months
Formats	<ul style="list-style-type: none">◦ Blended (Weekend classroom & Online content)*◦ Online only (Online content with weekend personalised mentoring)
Suitable for	Working professionals who want to hone their skills in Data Science, Machine Learning and Deep Learning, and transition to roles like Data Scientists, Machine Learning Engineers, Technology Architects, Solution Engineers, Chief Technology Officers etc.

12 Months | 30 Days of Classroom Sessions (Weekends*)

*Friday, Saturday & Sunday in odd months (m1, m3, m5....) and Saturday & Sunday in even months (m2, m4, m6....)





WHAT MAKES OUR AIML⁷ PROGRAM UNIQUE?

- 1 Covers Artificial Intelligence & Machine Learning technologies and applications including Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Reinforcement Learning, Neural Network, Tensor Flow and many more.
- 2 Hands-on program using AI and ML lab and 12+ projects. It features case studies and learning from some of the top global companies like Uber, Netflix, Google, Amazon etc.
- 3 Detailed solution and personalised feedback of the Projects is provided.
- 4 As part of this program, you will be making all of your submissions on Github. Github is an online repository which helps you to store all the projects and assignments you have done as part of this program in a single place. Today, most companies look at potential recruits Github profiles to check their technical expertise before hiring them.
- 5 Designed by leading academic and industry experts along with IIT-Bombay faculty.

BENEFITS OF LEARNING⁷ ONLINE

GOAL ACHIEVEMENT

By linking students to a mentor from their field of study, students can get a better understanding of possible career paths from industry professionals.

PERSONALIZED DEVELOPMENT OPPORTUNITY

Dedicated mentors help address individual learning needs and help students to develop skills & expertise.

BEING INDUSTRY READY

Right guidance from mentors helps students learn about best industry practices and become industry ready.

PEER LEARNING

Mentors ensure there is consistent engagement between the students.

CERTIFICATE⁷

The program is internationally recognized and participants earn dual certificates from The University of Texas at Austin and Great Lakes Executive Learning.





PROGRAM CURRICULUM

FOUNDATIONS

Module 1

Python for Machine Learning

- Python Basics
- Python Functions and Packages
- Working with Data Structures, Arrays, Vectors & Data Frames
- Jupyter Notebook – Installation & function
- Pandas, NumPy, Matplotlib, Seaborn

Self paced module

EDA and Data Processing

- Data Types
- Dispersion & Skewness
- Uni & Multivariate Analysis
- Data imputation
- Identifying and normalizing Outliers

Module 2

Statistical Learning

- Descriptive Statistics
- Probability & Conditional Probability
- Hypothesis Testing
- Inferential Statistics
- Probability Distributions

MACHINE LEARNING

Module 1

Supervised learning

- Linear Regression
- Multiple Variable Linear Regression
- Logistic Regression
- Naive Bayes Classifiers
- k-NN Classification
- Support Vector Machines

Module 2

Ensemble Techniques

- Decision Trees
- Bagging
- Random Forests
- Boosting

Module 3

Feature Selection

- Feature Engineering and its importance
- EDA
- Feature Selection (Forward selection, Backward Elimination)
- Regularization for Feature Selection
- Regularizing Linear Models (Shrinkage methods) - Lasso and Ridge

Module 4

Unsupervised learning

- K-means Clustering
- Hierarchical Clustering
- Dimension Reduction-PCA

Module 5

Model Selection & Hyper parameter Tuning

- Model Selection - Cross Validation
- Bootstrap Sampling
- Hyper Parameters & Tuning
- Hyper Parameters & Tuning (GridsearchCV/RandomizedSearchCv)
- Performance Evaluation
- Sampling

Module 6

Recommendation Systems

- Introduction to Recommendation Systems
- Popularity based model
- Content based Recommendation System
- Collaborative Filtering (User similarity & Item similarity)
- Hybrid Models

Self paced modules

Time-series Forecasting

- Introduction to forecasting data
- Properties of Time Series data
- Examples and features of Time Series data
- Naive, Average and Moving Average Forecasting
- Exponential Smoothing
- ARIMA Approach

Model deployment

- Model serialization- pickle and joblib
- Rest APIs- Flask (real-time prediction)
- Docker Containerization
- Kubernetes (using Google cloud)

ARTIFICIAL INTELLIGENCE

Module 1

Introduction to Neural Networks and Deep Learning

- Introduction to Perceptron & Neural Networks
- Activation and Loss functions
- Gradient Descent
- Batch Normalization
- TensorFlow & Keras for Neural Networks
- Hyper Parameter Tuning

Module 2

Computer Vision

- Introduction to Convolutional Neural Networks
- Introduction to images
- Convolution, Pooling, Padding & its mechanisms
- Forward Propagation & Backpropagation for CNNs
- CNN architectures like AlexNet, VGGNet, InceptionNet & ResNet
- Transfer Learning

Module 3

Advanced Computer Vision

- Object Detection
- YOLO, R-CNN, SSD
- Semantic Segmentation
- U-Net
- Face Recognition using Siamese Networks
- Instance Segmentation

Module 4

Statistical NLP

- Introduction to NLP
- Stop Words
- Tokenization
- Stemming and lemmatization
- Bag of Words Model
- Word Vectorizer
- TF-IDF
- POS Tagging
- Named Entity Recognition

Module 5

Sequential Models in NLP

- Introduction to Sequential data
- RNNs and its mechanisms
- Vanishing & Exploding gradients in RNNs
- LSTMs - Long short-term memory
- GRUs - Gated recurrent unit
- LSTMs Applications
- Time series analysis
- LSTMs with attention mechanism
- Neural Machine Translation
- Advanced Language Models: Transformers, BERT, XLNet

Self paced module

Introduction to Reinforcement Learning (RL)

- RL Framework
- Component of RL Framework
- Examples of RL Systems
- Types of RL Systems
- Q-learning

Self paced module

Introduction to GANs (Generative adversarial networks)*








- Introduction to GANs
- Generative Networks
- Adversarial Networks
- How GANs work?
- DCGANs - Deep Convolution
- GANs Applications of GANs

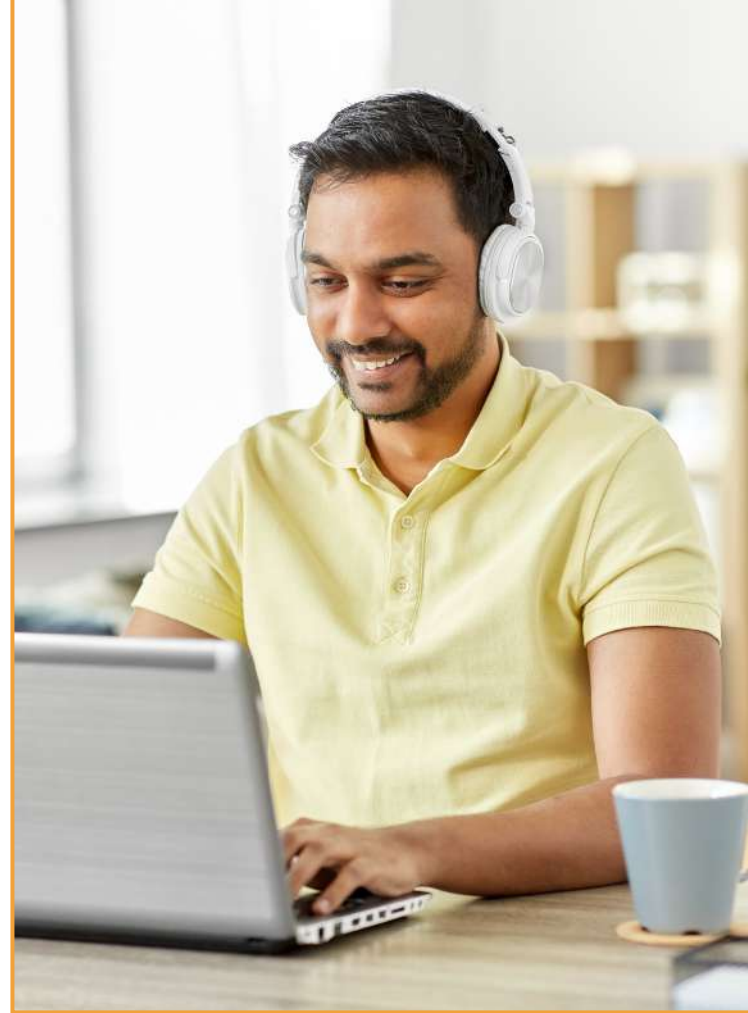
LANGUAGES & TOOLS

PGP-ML TOOLS

	Python ML library Scikit-learn
	Tkinter
	Flask
	Pandas
	Numpy
	Scipy
	Matplotlib
	Spacy

PGP-AIML TOOLS

	Python, NLP library NLTK
	Tkinter
	Flask
	TensorFlow
	OpenCV
	Keras
	Gluon



PROJECTS

1

To identify the potential customers who have a higher probability to churn using ensemble prediction model

A telecom company wants to use their historical customer data to predict behaviour to retain customers. You can analyse all relevant customer data and develop focused customer retention programs.

2

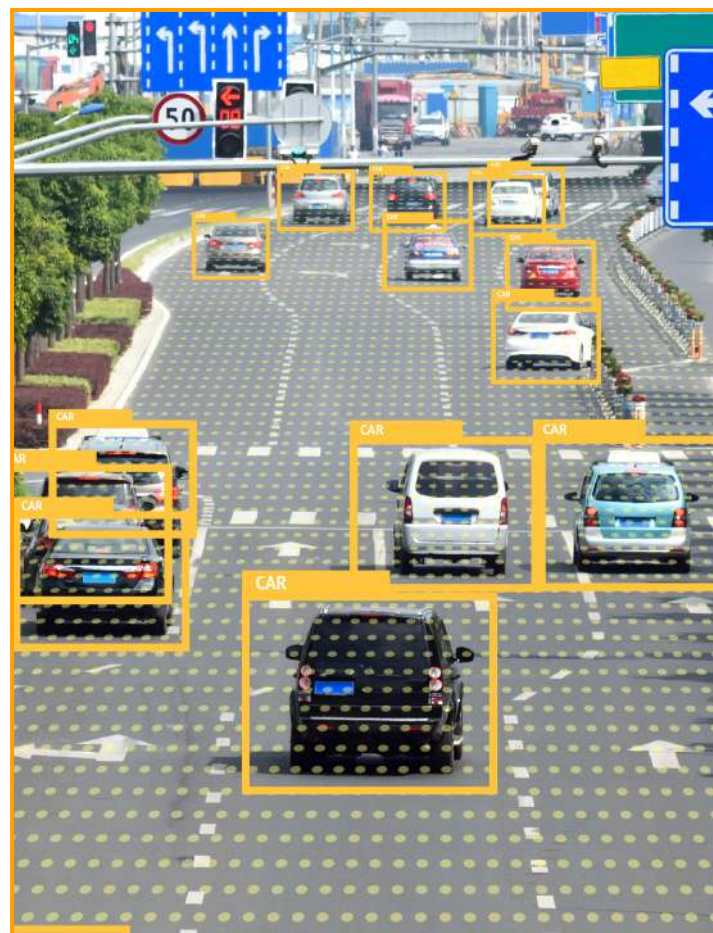
To cluster the vehicles as per their fuel consumption attributes and later train a regression model for an automobile dataset

The purpose is to classify a given vehicle as one of three types of vehicles, using a set of features extracted from the silhouette. The vehicle may be viewed from one of many different angles.

3

To create an automation using computer vision to impute dynamic bounding boxes to locate cars or vehicles on the road.

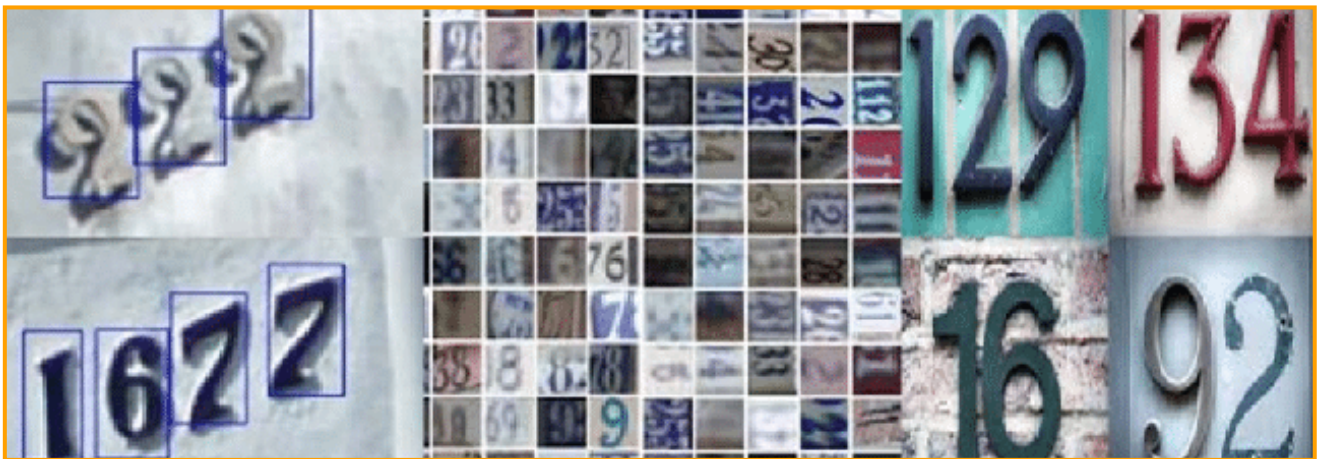
City X's traffic department wants to understand the traffic density on road during busy hours in order to efficiently program their traffic lights.



4

Implementing an Image classification neural network to classify Street House View Numbers

Recognizing multi-digit numbers in photographs captured at street level is an important component of modern-day map making. A classic example of a corpus of such street-level photographs is Google's Street View imagery composed of hundreds of millions of geo-located 360-degree panoramic images. The ability to automatically transcribe an address number from a geolocated patch of pixels and associate the transcribed number with a known street address helps pinpoint, with a high degree of accuracy, the location of the building it represents.



More broadly, recognizing numbers in photographs is a problem of interest to the optical character recognition community. While OCR on constrained domains like document processing is well studied, arbitrary multi-character text recognition in photographs is still highly challenging. This difficulty arises due to the wide variability in the visual appearance of text in the wild on account of a large range of fonts, colors, styles, orientations, and character arrangements. The recognition problem is further complicated by environmental factors such as lighting, shadows, secularities, and occlusions as well as by image acquisition factors such as resolution, motion, and focus blur.

5

Predicting the condition of the patient depending on the received test results

This project has two parts. In the first part we are trying to predict the condition of the patient depending on the received test results on biomechanics features of the patients according to their current conditions. In part II, we need to design a supervised learning prediction model to perform targeted marketing for executing a digital marketing campaign for a bank.

6

To build a NLP classifier which can use input text parameters to determine the label/s of the blog.

Classification is probably the most popular task that you would deal with in real life. Text in the form of blogs, posts, articles, etc. is written every second. It is a challenge to predict the information about the writer without knowing about him/her. We are going to create a classifier that predicts multiple features of the author of a given text. We have designed it as a Multi label classification problem.

7

To build a recommendation system using popularity based and collaborative filtering methods to recommend mobile phones to a user which are most popular and personalised respectively.

India is the second largest market globally for smartphones after China. About 134 million smartphones were sold across India in the year 2017 and is estimated to increase to about 442 million in 2022. India ranked second in the average time spent on mobile web by smartphone users across Asia Pacific.

The combination of very high sales volumes and the average smartphone consumer behaviour has made India a very attractive market for foreign vendors. As per Consumer behaviour, 97% of consumers turn to a search engine when they are buying a product vs. 15% who turn to social media.

If a seller succeeds to publish smartphones based on user's behaviour/choice at the right place, there are 90% chances that user will enquire for the same. This Case Study is targeted to build a recommendation system based on the individual consumer's behaviour or choice.



8

Sarcasm Detection using Bidirectional LSTMs

Past studies in Sarcasm Detection mostly make use of Twitter datasets collected using hashtag based supervision but such datasets are noisy in terms of labels and language. Furthermore, many tweets are replies to other tweets and detecting sarcasm in these requires the availability of contextual tweets. In this hands-on project, the goal is to build a model to detect whether a sentence is sarcastic or not, using Bidirectional LSTMs.

9

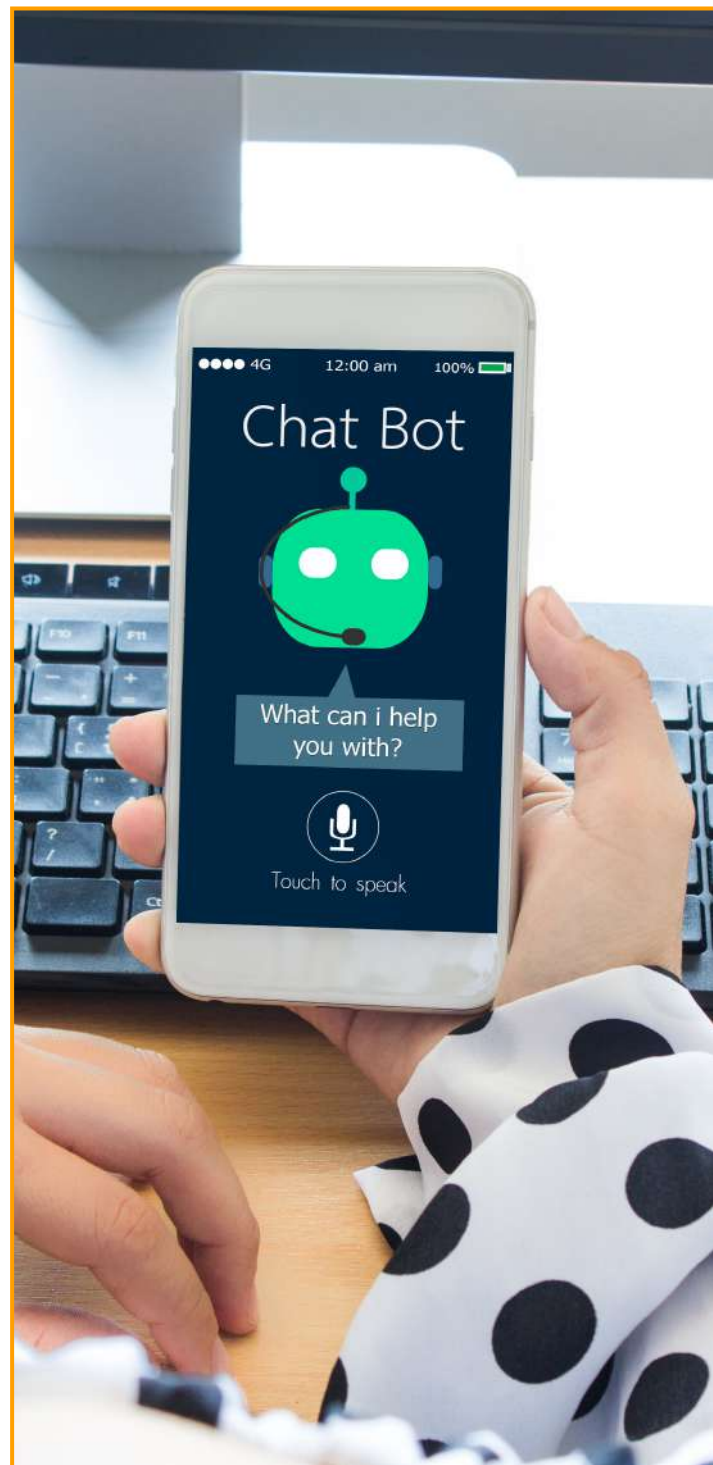
To build a semi-rule based text chat bot which can give static responses to the user depending on the inputs for industrial safety and incidents

Linguistic chatbots have become a must to have automation for large organisations with a huge client base. They serve as a virtual support, Helpdesk, sales agents etc enhancing the business and the customer experience.

10

To build an image classifier and object detection model which can classify a car from an image and identify the location of the car from an image by publishing a bounding box around it

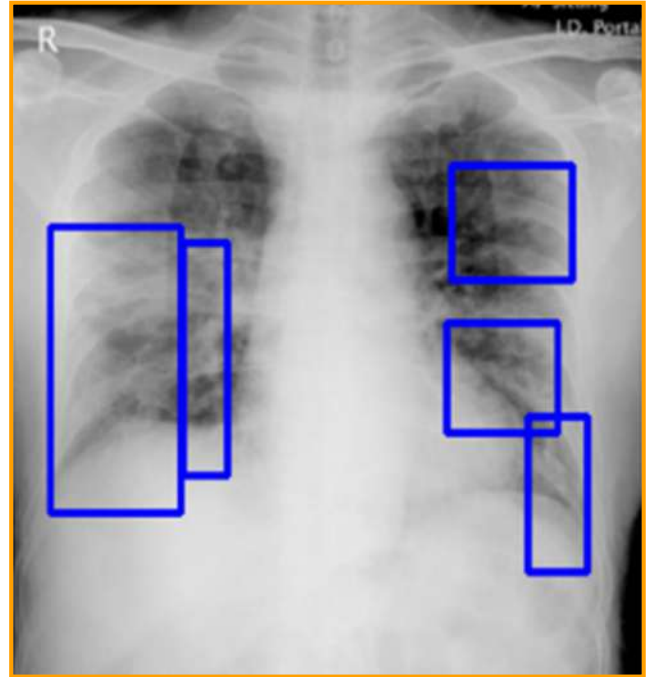
Image classifiers have become a must to have automation for organisations chasing towards employing autonomous AI bots. Computer vision can be used to automate supervision and generate appropriate action triggers if the event is predicted from the image of interest. For example a car moving on the road can be easily identified by a camera as make of the car, type, colour, number plates, etc.



11

To build an image classifier and object detection model which can classify an chest X-ray image into with/without pneumonia disease and identify the location of the chest X-ray where the disease is localised by publishing a bounding box around it

The designed model can be used as a micro service within an application which can assist hospitals and patients to detect the health condition of the patient just by scanning the X-ray file generated. Project involves designing a full stack deep learning AI solution covering data warehousing, data cleansing, validation, machine learning model design/ validation/tuning, model freezing/baseline and model deployment using a clickable UI.



12

To build an image classifier which can classify images of dogs as per their breeds

Image classifiers have become a must to have automation for organisations chasing towards employing autonomous AI bots. This image classifier can be a micro service for identifying if the captured image is a dog and later identifying which breed or class the animal belongs to. The learnings and experience obtained to design this automation can be trained and deployed on different image/class dataset too.

FACULTY

**DR. KUMAR MUTHURAMAN**

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Adjunct Faculty Member,
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**DR. AMIT SETHI**

Faculty
(IIT Bombay)



Faculty has contributed to program curriculum and online learning content only.

TESTIMONIALS

**MANISH KUMAR**

Senior Engineer, **Tata Consulting Engineers Limited**

"The program learning experience has been smooth and great. The program is well structured and the learning content provided is up-to-date and covers both theoretical and industrial application aspects. Hands-on exercises and projects at the end of the module are really helpful in gaining confidence."

**DHINESH KUMAR GANESHAN**

Lead Consultant
Infosys

"Great Learning's PGP-AIML Course is an eye-opener on future technologies and opportunities and is led by industry experts who put their efforts into ensuring that the knowledge is shared in the right sense. They try to help students to gain critical information that is important for their career success."

GREAT ALUMNI WORK IN

LEADING COMPANIES

 Microsoft	 amazon	 Google	 YAHOO!
 Cognizant	 DELL	 hp	 IBM
 Adobe®	 Infosys®	 accenture	 MÆRSK
 ORACLE®	 intel®	 Standard Chartered	 AMERICAN EXPRESS
 Deloitte.	 McKinsey&Company	 BARCLAYS	 yatra
 TARGET	 HCL	 PHILIPS	 SONY
 Honeywell	 NOKIA	 vmware®	 SAP®
 KPMG	 htc	 Deutsche Bank	 QUALCOMM®
 TAJ	 verizon✓	 Jio	 EY
 Flipkart 	 citi	 Capgemini	 SAMSUNG
 Fractal	 J.P.Morgan	 zomato	 cisco
 RBS	 Shell	 Hindustan Unilever Limited	 BOEING
 SIEMENS	 Morgan Stanley	 Mu Sigma	 vodafone

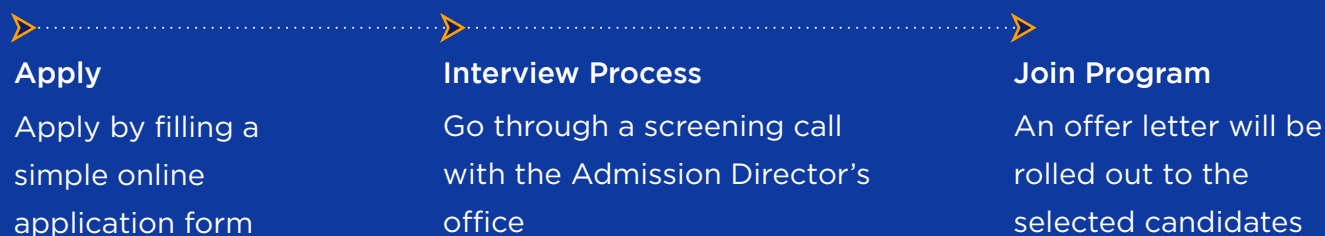
COMPARISON⁷

S.no	Features	PGP ML (Online)	PGP ML (Blended)	PGP AIML (Online)	PGP AIML (Blended)
1	Duration	7 months	7 months	12 months	12 months
2	E-portfolio	✓	✓	✓	✓
3	PG Certificate (Great Lakes)	✓	✓	✓	✓
4	Github Repository	✓	✓	✓	✓
5	In-person real-time assistance from Subject Matter Experts	×	✓	×	✓
6	Personalized Mentorship from Industry experts	✓	×	✓	×
7	Career assistance	✓	✓	✓	✓
8	No. of projects	6+	6+	10+	10+
9	In-person interaction with faculty	×	✓	×	✓
10	Capstone project	✓	✓	✓	✓
11	Tools covered	Scikit-learn, Pandas, Numpy, Scipy, Matplotlib		Scikit-learn, Pandas, Numpy, Scipy, Matplotlib, Keras, TensorFlow,	
12	Hackathon	✓	✓	✓	✓
13	Classroom sessions	×	✓	×	✓
14	Lab Sessions	×	✓	×	✓

ADMISSION DETAILS

S. No	Features	PGP-ML (online)	PGP-ML (Blended)	PGP-AIML (online)	PGP-AIML (Blended)
1	Eligibility	Applicants should have a Bachelor's degree with a minimum of 50% aggregate marks or equivalent and familiarity with programming. For candidates who do not know Python, we offer a free pre-program tutorial.		Applicants should have a bachelor's degree with a minimum of 50% aggregate marks or equivalent. Preference will be given to candidates with Engineering, Mathematics, Statistics, and Economics background.	
2	Fees	1,50,000 + GST	2,50,000 + GST* <i>*(Includes tuition fee, lab access, learning materials, meals & refreshments on the days of classes.)</i>	2,40,000 + GST	3,60,000 + GST* <i>*(Includes tuition fee, lab access, learning materials, meals & refreshments on the days of classes.)</i>

SELECTION PROCESS



FINANCIAL AID

With our corporate financial partnerships avail education loans at 0% interest rate*.



*Conditions Apply. Please reach out to the admissions team for more details.

PROGRAM PARTNERS



The University of Texas—Austin is one of the largest schools in USA. It was founded in 1883. Today UT Austin is a world-renowned higher education, research-intensive institution, serving more than 51,000 students annually with a teaching faculty of around 3,000. University of Texas at Austin is ranked #4 worldwide for Business Analytics according to the QS University rankings 2020.



Great Lakes mission is to become a Center of Excellence in fostering managerial leadership and entrepreneurship in the development of human capital through quality research, teaching, residential learning and professional management services.



Great Learning is one of India's leading ed-tech companies for professional and higher education. It offers comprehensive, industry-relevant programs in Software Engineering, Business Management, Business Analytics, Data Science, Machine Learning, Artificial Intelligence, Cloud Computing, Cyber Security, Digital Marketing, Design Thinking, and more. Great Learning's programs are developed in collaboration with the world's foremost academic institutions like Stanford University, The University of Texas at Austin, Indian Institute of Technology, Madras (IIT Madras), People's Education Society University, Bengaluru (PES University, Bengaluru) and Great Lakes Institute of Management and are constantly reimaged and revamped to address the dynamic needs of the industry. Great Learning is the only ed-tech company to provide these programs in a blended mode, classroom mode and in purely online mode, relying on its vast network of expert mentors and highly qualified faculty to deliver an unmatched learning experience for learners in India and the world over. Having impacted 750,000 learners from over 160+ countries, Great Learning is on a mission to enable transformative learning and career success in the digital economy for professionals and students across the globe.

READY TO ADVANCE
YOUR CAREER?

APPLY NOW

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