upGrad | iit-b ज्ञानमुत्तमम् & LIVERPOOL JOHN MOORES UNIVERSITY

Master of Science in

Machine Learning & AI

18 MONTHS | ONLINE

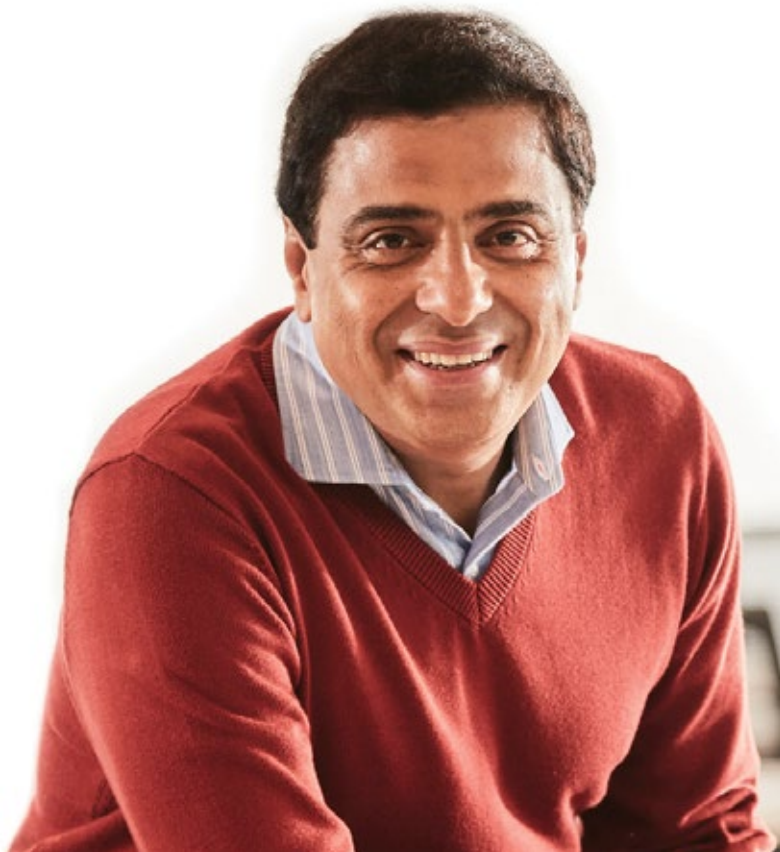
upGrad

upGrad is an online education platform to help individuals develop their professional potential in the most engaging learning environment. Online education is a fundamental disruption that will have a far-reaching impact. At upGrad, we are working towards transforming this online education wave into a tsunami! We are taking a full stack approach of leveraging content, technology, marketing and services to offer quality education at scale in partnership with corporates & academics to offer a rigorous & industry relevant program.

The field of Machine Learning is maturing rapidly and demands professionals skilled not only in Statistics, but also in advanced concepts such as Natural Language Processing and Neural Networks. Our vision is to design and deliver a quality online Master of Science in Machine Learning & AI to produce top-notch Machine Learning experts and help India capitalize the next wave of Artificial Intelligence. With upGrad, we promise to equip you with the perfect mix of business acumen and technical capabilities to help you contribute to this technological revolution.

Ronnie Screwvala

Co-founder & Chairman
upGrad



WHY MACHINE LEARNING & AI WITH UPGRAD, IIIT-B AND LJMU

MASTER'S DEGREE BY LJMU

Get a reputed Master's degree same as on-campus degree from LJMU

ONE-ON-ONE MENTORSHIP

Get mentored by a thesis supervisor for the dissertation project.

GLOBAL ACCESS TO JOBS

Explore career options globally with a globally recognised Master's degree.

ALUMNI STATUS OF LJMU

Earn Alumni status of IIIT-Bangalore and LJMU, with digital library access from LJMU

INSIGHTS FROM LJMU FACULTY

PROF PAULO LISBOA
HOD - Applied Mathematics
LJMU

DR ATIF WARAICH
Faculty - Computer Science
LJMU

PROF DHIYA AL-JUMEILY
Associate Dean
LJMU

DR GABRIELA CZANNER
Faculty - Engineering and Tech
LJMU

INSIGHTS FROM INDUSTRY EXPERTS

S. ANAND
CEO
Gramener

UJJYAINI MITRA
Head of Analytics
Viacom 18

HINDOL BASU
Partner
Tata IQ

KALPANA SUBBARAMAPPA
Ex-AVP, Decision Sciences
GENPACT

SAI ALLURI
PRO Analytics &
Strategy Manager
Uber

ANKIT JAIN
Data Scientist
Uber

RAJ ONKAR
Data Science Manager
Accenture

ANSHUMAN GUPTA, PHD
Director - Data Science
Pitney Bowes

CONCEPTS FROM TOP ACADEMICIANS

PROF. S. SADAGOPAN
Director
IIIT Bangalore

TRICHA ANJALI
Associate Professor
IIIT Bangalore

G SRINIVASARAGHAVAN
Professor
IIIT Bangalore

DINESH BABU JAYAGOPI
Assistant Professor
IIIT Bangalore

CHANDRASHEKAR RAMANATHAN
Dean (Academics)
IIIT Bangalore

SRINATH SRINIVASA
Dean (R&D)
IIIT Bangalore

MASTER'S PROGRAM IN MACHINE LEARNING & AI. HOW DOES IT WORK?

MASTER OF SCIENCE IN MACHINE LEARNING & AI

PG DIPLOMA IN MACHINE LEARNING & AI

12 months — 110 credits

iiit-b International Institute of Information Technology Bangalore
ज्ञानमुत्तमम्

Next

After successful completion of the PG Diploma in Machine Learning & AI | upGrad and IIIT-B

RESEARCH METHODOLOGIES

2 months — 10 credits

LIVERPOOL JOHN MOORES UNIVERSITY

MASTER'S DISSERTATION

4 months — 60 credits

LIVERPOOL JOHN MOORES UNIVERSITY

PROGRAM CURRICULUM

Note: This curriculum is subject to change based on inputs from IIIT-B, LJMU and industry modules marked as (*) are optional.

PRE-PROGRAM PREPARATION

INTRODUCTION TO PYTHON
Build a foundation for the most in-demand programming language of the 21st century.

PYTHON FOR DATA SCIENCE
Learn how to manipulate datasets in Python using Pandas which is the most powerful library for data preparation and analysis.

MATH FOR MACHINE LEARNING
Learn the fundamental mathematical concepts that'll make the understanding of ML algorithms better

DATA VISUALISATION IN PYTHON
Humans are visual learners and hence no task related to data is complete without visualisation. Learn to plot and interpret various graphs in Python and observe how they make data analysis and drawing insights easier.

DATA ANALYSIS USING SQL
Data in companies is definitely not stored in excel sheets! Learn the fundamentals of database and extract information from RDBMS using the structured query language.

ADVANCED SQL
Design a database from scratch and use programming constructs in SQL to extract data for advanced analysis

STATISTICS AND EXPLORATORY DATA ANALYTICS

ANALYTICS PROBLEM SOLVING
Understand the concepts of the CRISP - DM framework for business problem solving which is widely used in the industry

INVESTMENT CASE STUDY
The students will fill in the shoes of an analyst at an investment bank and determine where the firm should invest. They will then have to explain their recommendations in lieu of the analysis conducted.

INFERENTIAL STATISTICS
Build a strong statistical foundation and learn how to 'infer' insights from a huge population using a small sample.

HYPOTHESIS TESTING
Understand how to formulate and validate hypotheses for a population to solve real-life business problems.

EXPLORATORY DATA ANALYSIS
Learn how to find and analyse the patterns in the data to draw actionable insights.

GROUP PROJECT
Determine which customers are at the risk of default and what are their charecteristics so as to avoid providing loans to similar people in the future.

MACHINE LEARNING - 1

LINEAR REGRESSION
Venture into the machine learning community by learning how one variable can be predicted using several other variables through a housing dataset where you will predict the prices of houses based on various factors.

INVESTMENT CASE STUDY
The students will fill in the shoes of an analyst at an investment bank and determine where the firm should invest. They will then have to explain their recommendations in lieu of the analysis conducted.

LINEAR REGRESSION ASSIGNMENT
Build a model to understand the factors car prices vary on and help a Chinese company enter the US car market.

LOGISTIC REGRESSION
Learn your first binary classification technique by determining which customers of a telecom operator are likely to churn versus who are not to help the business retain customers.

NAIVE BAYES
Understand the basic building blocks of Naive Bayes and learn how to build an SMS Spam Ham Classifier using Naive Bayes technique

MODEL SELECTION
Learn the pros and cons of simple and complex models and the different methods for quantifying model complexity, alongwith regularisation and cross validation

MACHINE LEARNING - 2

ADVANCED REGRESSION
Understand generalised regression and different feature selection techniques alongwith the perils of overfitting and how it can be countered using regularisation.

SUPPORT VECTOR MACHINE (OPTIONAL)
Learn how to find a maximal marginal classifier using SVM, and use them to detect spam emails, recognise alphabets and more!

TREE MODELS
Learn how the human decision making process can be replicated using a decision tree and other powerful ensemble algorithms.

MODEL SELECTION - PRACTICAL CONSIDERATIONS
Given a business problem, how do you choose the best algorithm? Learn a few practical tips for doing this here

BOOSTING
Learn how weak learners can be 'boosted' with the help of each other and become strong learners using different boosting algorithms such as Adaboost, GBM, and XGBoost.

UNSUPERVISED LEARNING: CLUSTERING
Learn how to group elements into different clusters when you don't have any pre-defined labels to segregate them through K-means clustering, hierarchical clustering, and more.

UNSUPERVISED LEARNING: PRINCIPAL COMPONENT ANALYSIS
Understand important concepts related to dimensionality reduction, the basic idea and the learning algorithm of PCA, and its practical applications on supervised and unsupervised problems.

TELECOM CHURN CASE STUDY
Solve the most crucial business problem for a leading telecom operator in India and southeast Asia - predicting customer churn.

NATURAL LANGUAGE PROCESSING

LEXICAL PROCESSING
Do you get annoyed by the constant spams in yor mail box? Wouldn't it be nice if we had a program to check your spellings? In this module learn how to build a spell checker & spam detector using techniques like phonetic hashing,bag-of-words, TF-IDF, etc.

SYNTACTIC PROCESSING
Learn how to analyse the syntax or the grammatical structure of sentences with the help of algorithms & techniques like HMMs, Viterbi Algorithm, Named Entity Recognition (NER), etc.

SYNTACTIC PROCESSING -ASSIGNMENT
Build a POS tagger for tagging unknown words using HMM's & modified Viterbi algorithm.

SEMANTIC PROCESSING
Learn the most interesting area in the field of NLP and understand different techniques like word-embeddings, LSA, topic modelling to build an application that extracts opinions about socially relevant issues (such as demonetisation) on social media platforms

BUILDING CHATBOTS WITH RASA
Imagine if you could make restaurant booking without opening Zomato. Build your own restaurant-search chatbot with the help of RASA - an open source framework and deploy it on Slack.

DEEP LEARNING

INTRODUCTION TO NEURAL NETWORKS
Learn the most sophisticated and cutting-edge technique in machine learning - Artificial Neural Networks or ANNs

NEURAL NETWORKS - ASSIGNMENT
Build a neural network from scratch in Numpy to identify handwritten digits.

CONVOLUTIONAL NEURAL NETWORKS -INDUSTRY APPLICATIONS
Learn the basics of CNN and OpenCV and apply it to Computer Vision tasks like detecting anomalies in chest X-Ray scans, vehicle detection to count & categorise them to help the government ascertain the width and strength of the road.

RECURRENT NEURAL NETWORKS
Ever wondered what goes behind machine translation, sentiment analysis, speech recognition etc. ? Learn how RNN helps in these areas having sequential data like text, speech,videos,etc

NEURAL NETWORKS PROJECT - GESTURE RECOGNITION
Make a Smart TV system which can control the TV with user's hand gestures as the remote control

REINFORCEMENT LEARNING

CLASSICAL REINFORCEMENT LEARNING
Ever wondered how Alpha Go beat the best GO player or how Boston Dynamics made robots that can run. Start your journey with the classical RL algorithms like dynamic programming, Monte Carlo methods, Q Learning to train the state value and action value functions of the policy.

ASSIGNMENT -CLASSICAL REINFORCEMENT LEARNING
Train an agent that'll beat you in the game of numerical tic-tac-toe everytime you play

DEEP REINFORCEMENT LEARNING
Want to build your own Atari Game? Learn the Q-function or policy using the various Deep Reinforcement Learning algorithms: Deep Q Learning, Policy Gradient Methods, Actor- Critic method.

REINFORCEMENT LEARNING PROJECT
Improve the recommendation of the the rides to the cab drivers by creating a RL based algorithm using vanilla Deep Q-Learning (DQN) to maximize the driver's profits and inturn help in retention of the driver on the cab aggregator service.

CAPSTONE

DEPLOYMENT
Learn how to productionize your model and deploy it on the server.

CAPSTONE
Choose from a range of real-world industry woven projects on advanced topics like Recommendation Systems, Fraud Detection, Emotion Detection from faces, Social Media Listening, Speech Recognition among many others.

RESEARCH METHODOLOGY

INTRODUCTION TO RESEARCH AND RESEARCH PROCESS
Learn about the importance of research and the different aspects of a good research questions

RESEARCH DESIGN
Develop an understanding of various research designs

LITERATURE REVIEWING
Learn how to formulate a research question by reviewing different types of resources

RESEARCH PROJECT MANAGEMENT
Develop one of the most important skills: Project Management that'll help you in completing the dissertation in time

REPORT WRITING AND PRESENTATION
Learn about the formats required for the dissertation and the citation style that you should follow

SCIENTIFIC ETHICS
Develop an understanding of the different aspects of ethics in research

PROGRAM DETAILS

PROGRAM STARTS
Please refer to the website for program start dates

DURATION
18 months

PROGRAM FLOW
12 months - PG Diploma in Machine Learning & AI
2 months - Research Methodology
4 months - Master's Dissertation

WEEKLY COMMITMENT
12 hours per week

PROGRAM FEE
₹4,85,000 (Incl. of all taxes)
Flexible Payment Options Available

For further details, call us at +91 9987828880 or contact:

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