Deep Learning & Generative AI

-- Working with images, NLP & sensor data --

FORE School of Management
New Delhi

About Deep Learning & Generative AI

Deep Learning has been a subject of study since the inception of neural networks. With an advancement in technology, especially Graphical Processing Units (GPUs), the field of AI has seen almost explosive growth. Demand for knowledgeable and skilled personnel in this area has received a fillip. Applications of deep learning and AI range from Computer Vision to Speech recognition, language translation to marketing and to drug discovery. It is used widely in Recommender Engines and forms the basis for autonomous vehicles. Generative AI goes a step further in generating data itself. It takes text, audio, images or videos as inputs, gets trained on them, learns their statistics and patterns and then generates similar content—text, music, images or videos. Generative AI can be used to improve customer interactions through enhanced chat and search experiences; explore vast amounts of unstructured data through conversational interfaces and summarizations; assist with repetitive tasks like replying to requests for proposals (RFPs), localizing marketing content in different languages, and checking customer contracts for compliance, and more. As applications of AI span multiple areas and sectors, the course is a cross-discipline course.

This program covers Deep Learning and AI technologies extensively. Students work with diverse projects while studying generative AI software.

1. Completely hands-on course--Students work with image, text and sensor data from business & Industry
2. Students experiment with industry standard open-source technologies—frequently used in most cloud platforms.
3. After the program concludes, we are open to a six-months free-consultancy in implementing a pilot-project on building deep learning models.

About the Course

We begin by introducing participants to python language and its libraries--numpy and pandas. The program requires programming, and we prefer that a participant to the program has some prior programming background in any computer language (not necessarily in python). We work with two predominant AI libraries: Tensorflow and PyTorch. Students will also work with ready-to-use LLM models available in Hugging Face.

The course is predominantly practice based rather than theory dominated. We carefully avoid mathematics—techniques are explained conceptually and in depth. Immediately after a technique is explained, it is implemented through examples. Students perform a project on it with real world data. Thus, by the time a student finishes the course he has executed at the least eight to ten projects and published them on Kaggle and on GitHub.

We have two primary modules: These are on (a) *Deep Learning and Natural Language Processing*, and (b) *Generative AI*. In these modules we work with *Convolution Neural networks, Recurrent Neural Networks* and a number of associated deep learning data processing-blocks (such as: data augmentation, image pre-processing and others). We will study a mix of data types besides images as: videos, sensor data and audio data. The problems we study have been picked up from many domains, as for example, from banking and finance, manufacturing, marketing, healthcare and some others.

Generative AI is an extension of deep learning. While working with generative AI, we study Denoising diffusion probabilistic models (DDPMs), Generative Adversarial networks and Variational Autoencoders.

Some of our classroom teaching notebooks can be seen on the GitHub site..

Program duration and venue

The complete program duration is 56-hours. Classes can be held online or in class-rooms. In online mode, classes can be held either on appointed weekdays or on Saturdays and Sundays--each class is of 2-hour duration. In class room mode full day classes are held and these can be held at FORE School of Management, New Delhi.

Program requirements:

Students must have access to high-speed Internet (generally available now a days) and a lap-top with minimum of 16gb RAM. All software that we will work with are open-source and freely available. Students will also be provided with Virtual machines that have pre-configured software installed for experimentation.

Target Participants:

The program has applications in a large number of domains. Category of possible participants include Executives, engineers, decision makers, Data Scientists, Security Analysts, Business Analysts and Data Governance Teams.

Exercises and Projects

There is a heavy emphasis on exercises and projects. Students must experiment and implement systems themselves. Throughout the course students are to undertake several projects. We encourage students to use their organizational data to solve related problems.

Contacts

For any details please feel free to contact either the Program faculty, Prof Ashok K Harnal, at 8750893093 (WhatsApp) or Prof Asif Zameer, Chair, Executive Education at 9871053303 (WhatsApp).

Program Faculty

Prof. Ashok Kumar Harnal

Ashok Kumar Harnal has worked extensively at multiple facets of Big Data Systems--Machine Learning, Deep Learning & NLP, Big-Data storage systems (Hadoop and NoSQL databases), Graph Databases, Streaming Analytics using Apache Spark, Apache Kafka, Confluent and Reinforcement Learning. He has been teaching Big Data technology since around last twelve years. Since last nine years Prof Harnal has been collaborating closely with University of California, Riverside, in a program on taking sessions on Big Data for Executives from around the World. We have trained officers from several organizations including RITES, NABARD, TechMahindra, Punjab National Bank, Central Bank of India and Union Bank of India Presently we are training officers in one another Bank. What is a matter of pride for us is that many of our students are at very high positions in Industry. We have successfully conducted three programs on Healthcare Analytics; two programs were of three months duration and one of nine months duration. During his stay in Min of Defence, he has executed three country-wide projects on Information Systems: (a) *Raksha-Bhoomi* to computerize land records (as old as 150 years); (b) Knowledge Management of land-title related files/maps in all Defence Estates offices; and (c) Setting up of a Disaster Management organization: Archival Unit and Resource Center (AU&RC), at Delhi and Pune for safe storage of land-title related records in paper and digital forms. He has published two books (both by Tata McGraw-Hill); One on *How to program games on Computers* and the other on *Linux Administration and Applications*. His GitHub site is here.

Prof. Amarnath Mitra

Dr. Amarnath Mitra is working as an Associate Professor in the area of Information Technology and Big Data Analytics at FORE School of Management, New Delhi. Prior to joining FORE, Dr. Mitra worked as Senior Quant Analyst at BioUrja Power LLC (Texas, USA). Dr. Mitra has over five years of industry experience as an analyst and researcher with substantial exposure of working with big & high frequency data and analytics. In academics, Dr. Mitra worked as full-time faculty for over six years in management institutes such as BML Munjal University Gurugram, IMI New Delhi and IBS Hyderabad. As guest/visiting faculty he has taught in several reputed institutions like SIBM Pune, NMIMS Hyderabad, IIIT Bhubaneswar among others. Dr. Mitra has taught subjects like Data Science, Predictive Analytics, Business Analytics, Quantitative Methods, Business Research Methods, Operations Research, Econometrics, among others.

About FORE School of Management (FSM)

Foundation for Organizational Research and Education (FORE) is committed to the advancement of Management Education, Research, Training and Consultancy. Incorporated in 1981, as a non-profit institution, FORE has been working with industry and academia for developing new domains of managerial thought and education and contributing to building leaders in today's global business environment.

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Located in the heart of South Delhi, FSM provides contextual learning and helps in the development of students as thinking professionals, who have the ability to meet the future challenges of tomorrow's corporate leaders. The programmes develop multiple skills including managerial decision-making, problem-solving, analytical reasoning, communications, creativity, and innovation. FSM has been designing, developing, and conducting innovative Executive Education (EE)/ Management Development Programmes (MDPs) for working executives in India for over three decades.

FSM takes pride in its professional and high-quality faculty, modern infrastructure, technology, and resources- be it in the fields of General Management, Data Science, Human Resource, Finance, Operations, Marketing, Information Technology, Economics, and International Business.

Customized Training Program

These Programs are designed according to the specific needs of the corporate. The pedagogy used in keeping with the background, experience and aspirations of participants as specified.

Long Duration Training Program(LDPs)

Along with the above, FORE does long-duration programmes like PGPM (Executive Management programme), Big Data Analytics, Marketing Analytics, Healthcare Analytics. These are online or blended programmes of 3 months to 11 months.

Open Training Program (OTPs)

FSM Open Training Programs (MDPs) aim to equip business managers with knowledge, skills, and attitudes for effectively responding to global developments and competitive requirements. The emphasis is on developing the ability to apply learnings efficiently and improve decision-making.