LLM

1. Framework to Choose the Right LLM for your Business

Course Description

This course will guide you through the process of selecting the most suitable Large Language Model (LLM) for various business needs. By examining factors such as accuracy, cost, scalability, and integration, you will understand how different LLMs perform in specific scenarios, from customer support to healthcare and strategy development. The course emphasizes practical decision-making with real-world case studies, helping businesses navigate the rapidly evolving LLM landscape effectively.

Who should Enroll?

- Business leaders seeking to implement AI-driven solutions efficiently.
- Data scientists exploring LLMs for industry-specific applications.
- Tech professionals involved in AI integration and decision-making processes.
 Key Takeaways
- Understand how to evaluate and select the right LLM for business needs.
- Learn to assess LLMs based on accuracy, cost, scalability, and integration.
- Gain insights into real-world LLM applications through case studies.
- Develop practical decision-making skills for LLM adoption in various industries.

2. Improving Real World RAG Systems: Key Challenges & Practical Solutions

Course Description

This course explores the key challenges in building real-world Retrieval-Augmented Generation (RAG) systems and provides practical solutions. Topics include improving data retrieval, dealing with hallucinations, context selection, and optimizing system performance using advanced prompting, retrieval strategies, and evaluation techniques. Through hands-on demos, you will gain insights into better chunking, embedding models, and agentic RAG systems for more robust, real-world applications.

Who should Enroll?

- AI/ML professionals aiming to enhance RAG system performance and solve real-world challenges.
- Developers/Engineers building search, conversational, or generative AI systems needing better data retrieval and context handling.
- Researchers/Enthusiasts seeking hands-on experience with advanced RAG techniques and agentic systems.

Key Takeaways

- Master RAG systems with a solid grasp of architecture and components.
- Solve key challenges like missing content and hallucinations.
- Optimize performance with advanced chunking and retrieval strategies.
- Develop practical decision-making skills for LLM adoption in various industries.

3. A Comprehensive Learning Path to Become a Data Analyst in 2025

About the course

Where do I begin? Data Analyst is such a huge field - where do you even start learning about Data Analyst?

These are career-defining questions often asked by data analyst aspirants. There are a million resources out there to refer but the learning journey can be quite exhausting if you don't know where to start.

Don't worry, we are here to help you take your first steps into the world of data analytics! Here's the learning path for people who want to become a data analyst in 2025. We have arranged and compiled all the best resources in a structured manner so that you have a unified resource to become a successful data analyst.

Moreover, we have added the most in-demand skills for the year 2025 for data analyst along with exercises and assignments

4. Reimagining GenAI: Common Mistakes and Best Practices for Success

Course Description

Generative AI is transforming industries, but implementation challenges often hinder its success. This course, led by experienced GenAI expert Shabazz Mohammed, dives deep into the pitfalls of adopting generative AI and provides actionable best practices to overcome them.

Learn from real-world scenarios, understand why hi-fi demos fail in production, and gain insights into scalable, ethical, and ROI-driven AI adoption.

Key Takeaways

- Learn to identify and mitigate risks such as biased outputs, inefficiencies in resource usage, and ethical concerns, ensuring smooth and responsible deployment of GenAl solutions.
- Gain actionable insights into creating frameworks that align AI capabilities with organizational goals, enhancing productivity and delivering measurable business outcomes.
- Build hands-on expertise in using Generative AI effectively while maintaining data privacy, model explainability, and user trust through ethical and secure practices.

5. Coding a ChatGPT-style Language Model from Scratch in PyTorch

Course Description

Master the art of building a ChatGPT-style language model from scratch with PyTorch. In this course, you'll explore essential NLP concepts, implement transformers, and create a decoder-only architecture step-by-step. Guided by expert tutorials, gain practical skills to develop advanced AI models tailored for real-world applications.

Key Takeaways

- Understand transformer fundamentals with step-by-step guidance, including masked self-attention and position encoding.
- Build and train models using PyTorch, focusing on practical coding skills for NLP.
- Create a fully functional ChatGPT-style language model from scratch, ready for realworld use.

6. Mastering Multilingual GenAl Open-Weights for Indic Languages

Course Description

Mastering Multilingual GenAl – Open-Weights for Indic Languages" is a course designed to equip you with the knowledge to develop state-of-the-art multilingual AI models using openweight architectures. Focusing on low-resource languages, particularly Indic languages, the course covers essential topics like multilingual AI training, instruction fine-tuning, model building, and performance evaluation.

Key Takeaways

- Learn to create AI models for diverse languages, focusing on low-resource ones.
- Get hands-on experience with cutting-edge models and multilingual data.
- Implement strategies for safer, unbiased AI models in global applications.

7. Learning Autonomous Driving Behaviors with LLMs & RL

Course Description

This course dives into the development of autonomous driving behaviors using Reinforcement Learning (RL) and Large Language Models (LLMs). You'll explore how RL agents are trained to navigate complex, real-world environments while making safe, human-like driving decisions. The course tackles key challenges such as designing effective reward systems, ensuring safety in high-speed driving scenarios, and improving the interpretability of AI decisions. Through practical projects, you will design RL agents using techniques like Deep Q-Networks (DQN), experience replay, and integrate LLMs to enhance decision-making.

Key Takeaways

- Learn how to train RL agents for safe, human-like autonomous driving behavior.
- Understand how LLMs enhance decision-making and interpretability in AI systems.
- Gain practical experience in designing and applying reward functions for real-world autonomous environments.

8. GenAl Applied to Quantitative Finance: For Control Implementation

Implementation

This course explores the application of Generative AI in quantitative finance, focusing on building sustainable trading algorithms through keyword extraction, sentiment analysis, and time-series forecasting. Learn to predict commodity prices, such as gold, by integrating data from financial news sources, leveraging sentiment analysis, and optimizing models for robust trading signals.

Key Takeaways from this Course

- Learn how to apply advanced AI techniques to convert textual data, such as news articles, into actionable trading signals for predicting commodity prices.
- Understand the importance of a well-structured architecture that includes robust keyword extraction, sentiment mining, graph generation, and time series forecasting to drive predictive accuracy.
- Explore opportunities for further improvements, such as integrating large language models (LLMs), enhancing robustness, and achieving full automation in trading signal generation.

9. Navigating LLM Tradeoffs: Techniques for Speed, Cost, Scale & Accuracy

Course Description

This course provides a concise guide to optimizing Large Language Models (LLMs) by navigating tradeoffs in speed, cost, scale, and accuracy. Learn practical techniques like LoRA, model quantization, and parameter-efficient fine-tuning to improve performance while reducing costs. You'll explore various deployment strategies and understand how to evaluate LLMs using industry-standard benchmarks, making this course ideal for anyone seeking efficient, scalable Al solutions.

Key Takeaways

 Optimize LLM Tradeoffs: Master techniques to balance speed, cost, scale, and accuracy for LLMs.

- Efficient Fine-Tuning: Use LoRA to train large models with less compute while maintaining performance.
- Model Quantization: Reduce memory use and boost inference speed with 8-bit/4-bit quantization.
- LLM Evaluation Metrics: Assess models with ROUGE, BLEU, and benchmark tools like HuggingFace Leaderboard.
- Inference Optimization: Multi-LoRA, Improve efficiency with KV caching and Flash attention for faster results.

10. Building Your first RAG System using LlamaIndex - Free Course

Building Your First RAG Model using LlamaIndex

This course will guide you through building your first Retrieval-Augmented Generation (RAG) system using LlamaIndex. You will start with data ingestion by loading a file into the system, followed by indexing the data for efficient retrieval. Next, you will set up retrieval configurations and use a response synthesizer to combine data into a coherent response. Finally, you will employ a query engine to generate responses. By the end of this course, you will have a solid understanding of these processes and be able to build an RAG system using LlamaIndex code effectively.

Key Takeaways from the course

- Learn the steps involved in building a RAG system using Llamaindex.
- Hands-On Experience: Engage with exercises designed to reinforce your learning and apply concepts in real-world scenarios.

11. Nano Course: Building Large Language Models for Code

Nano Course: Building Large Language Models for Code

In this Free Nano GenAl Course on Building Large Language Models for Code, you will-

• Learn how to train LLMs for Code from Scratch covering Training Data Curation, Data Preparation, Model Architecture, Training, and Evaluation Frameworks.

- Explore each step in-depth, delving into the algorithms and techniques used to create StarCoder, a 15B code generation model trained on 80+ programming languages.
- Understand and learn the best practices to train your own StarCoder on the data

NLP (Natural Language Processing)

1. Building a Text Classification Model with Natural Language Processing - Free Course

Introduction to Natural Language Processing with PyTorch

Gain practical insights into Natural Language Processing (NLP) with our comprehensive course. Learn to build NLP models using PyTorch, delve into classification models, and apply techniques like bag-of-words, count vectorizer and so on. Perfect for professionals seeking to enhance their skills and aspiring students entering the tech industry.

Who Should Enroll:

- **Professionals:** Expand your skill set with NLP for real-world applications in diverse industries.
- Aspiring Students: Master text data analysis and kickstart your career in AI and NLP.

Key Takeaways from the course

- Acquire practical skills in building NLP models using PyTorch
- Career Readiness: Prepare to apply NLP across industries, equipping yourself for roles in data science, AI, and text analysis with hands-on exercises.

2. Exploring Natural Language Processing (NLP) using Deep Learning

Beyond Traditional Natural Language Processing (NLP) - Master NLP using Deep Learning in PyTorch

Natural Language Processing (NLP) is the hottest field in the data science space right now. The demand for NLP experts and data scientists is through the roof.

We have seen a remarkable rise in the amount of research and breakthroughs in NLP recently. We can trace this recent rise to one (seismic) paper – "Attention is All You Need" by Google AI. This breakthrough has spawned so many new and exciting NLP libraries that enable us to work with text in ways that were previously limited to our imagination (or Hollywood).

These NLP deep learning developments have spawned some mind-boggling applications. We're sure you've already interacted with and used some of them yourself:

- Human-level chatbots (dialogue systems like Google Duplex and Meena)
- Text generation (Machines writing text from scrtach, such as OpenAI's GPT-2 model)

Here's a quick list of the latest Natural Language Processing concepts in deep learning every NLP expert and even enthusiast should know:

- Language Modeling
- Sequence-to-Sequence Modeling
- Attention Mechanism
- Transformer Architecture
- Transfer Learning in NLP, and much more!

These are key NLP deep learning concepts you should master if you want to successfully navigate through the NLP goldmine.

3. Introduction to Natural Language Processing

Introduction to Natural Language Processing (NLP)

Natural Language Processing is the art of extracting information from unstructured text. Learn basics of Natural Language Processing, Regular Expressions & text sentiment analysis using machine learning in this course.

4. Learn Swift for Data Science

Your Guide to Learning Swift for Data Science from Scratch

he Swift programming language is quickly becoming the language of choice for a lot of data science experts and professionals. Swift's flexibility, ease of use, excellent documentation, and quick execution speed are key reasons behind the language's recent prominence in the data science space.

Swift is a more efficient, stable and secure programming language as compared to Python. In fact, Swift is also a good language to build for mobile. In fact, it's the official language for developing iOS applications for the iPhone!

5. Data Science Hacks, Tips and Tricks

Do you want to write more efficient Python code? Want to become a better programmer? How about speeding up your data science tasks? This Data Science Hacks, Tips and Tricks course is for you!

The Data Science Hacks, Tips and Tricks course is your one stop destination to become a better and more efficient data scientist!

We have poured in our decades of experience with data science and programming (especially Python programming!), to provide you with time-saving hacks related to:

- 1. Python tips and tricks
- 2. Data exploration tips and tricks
- Data preprocessing hacks
- 4. Efficient use of Jupyter notebooks
- 5. Python functions
- 6. Building predictive models (hacks to build machine learning models in no time!),

Computer Vision(CV)

1. Building Your First Computer Vision Model - Free Course

Introduction to Computer Vision using PyTorch

This course will help you gain a deep understanding of Computer Vision and build advanced CV models using the PyTorch framework. With a carefully curated list of resources and exercises, this course is your guide to becoming a Computer Vision expert. Master the techniques to build convolutional neural networks, and classify images.

Who Should Enroll:

- Professionals: Individuals looking to expand their skill set and leverage CV across different industries.
- Aspiring Students: For those setting out on their journey to master image data analysis and leave a mark in the tech world.

Key Takeaways from the course

- Learn Computer Vision techniques and build real-world CV Models.
- Hands-On Experience: Engage with exercises designed to reinforce your learning and apply concepts in real-world scenarios.

2. A Comprehensive Learning Path to Become a Data Scientist in 2024

About the course

Where do I begin? Data science is such a huge field - where do you even start learning about Data Science?

These are career-defining questions often asked by data science aspirants. There are a million resources out there to refer but the learning journey can be quite exhausting if you don't know where to start.

Don't worry, we are here to help you take your first steps into the world of data science! Here's the learning path for people who want to become a data scientist in 2023. We have arranged and compiled all the best resources in a structured manner so that you have a unified resource to become a successful data scientist.

Moreover, we have added the most in-demand skills for the year 2023 for data scientists including storytelling, model deployment, and much more along with exercises and assignments.

Key takeaways of this course

The course is ideal for beginners in the field of Data Science. Several features which make it exciting are:

- Beginner friendly course: This is a beginner-friendly course and has no prerequisites.
- **Curated list of resources to follow**: All the necessary topics are covered in the course, in an orderly manner with links to relevant resources and hackathons.
- **Updated skillset for 2023**: The knowledge of Machine Learning models is important but that won't set you apart. We have included some of the top unique skills you'll require to become a data scientist in 2023.
- **Assignments to test yourself**: What's the best way to test your knowledge? Each module comes with assignments and MCQs to give your memory a boost.

3. Getting Started with Neural Networks

Introduction to Neural Networks

What is a neural network? How does it work? What does a neural network do? Learn neural networks for free in this course and get your neural network questions answered, including applications of neural networks in deep learning.

4. GenAl Applied to Quantitative Finance: For Control Implementation

GenAl Applied to Quantitative Finance: For Control Implementation

This course explores the application of Generative AI in quantitative finance, focusing on building sustainable trading algorithms through keyword extraction, sentiment analysis, and time-series forecasting. Learn to predict commodity prices, such as gold, by integrating data from financial news sources, leveraging sentiment analysis, and optimizing models for robust trading signals.

Key Takeaways from this Course

- Learn how to apply advanced AI techniques to convert textual data, such as news articles, into actionable trading signals for predicting commodity prices.
- Understand the importance of a well-structured architecture that includes robust keyword extraction, sentiment mining, graph generation, and time series forecasting to drive predictive accuracy.
- Explore opportunities for further improvements, such as integrating large language models (LLMs), enhancing robustness, and achieving full automation in trading signal generation.

Machine Learning

1. Machine Learning Summer Training

What is Machine Learning Summer Training?

If you are a college student and looking for summer training, then you are at the right place where Analytics Vidhya is providing its virtual training along with the mega hackathon for students all over the world to compete, win grand rewards and internship opportunities.

Machine Learning Summer Training is an online program to build and enhance your programming and machine learning skills, led by the best industry experts and data science professionals. After completing this training you will be provided with a blockchain enabled certificate by Analytics Vidhya with lifetime validity.

This is the perfect starting point to ignite your fledging machine learning career and take a HUGE step towards your dream data scientist role.

2. The A to Z of Unsupervised ML - Free Course

Why Unsupervised Machine Learning?

Unsupervised machine learning helps uncover hidden patterns and structures in data without labeled examples. It is essential for exploratory data analysis, reducing dimensionality, and discovering intrinsic relationships within datasets. Mastering unsupervised techniques enhances data preprocessing and drives insights in complex datasets where labels are scarce or unavailable.

Key Takeaways from the course

- Learn machine learning techniques and build real-world Unsupervised ML Models.
- Hands-On Experience: Engage with exercises designed to reinforce your learning and apply concepts in real-world scenarios.

3. Machine Learning Certification Course for Beginners

What is Machine Learning?

Machine Learning is the science of teaching machines how to learn by themselves. Machine Learning is reshaping and revolutionizing the world and disrupting industries and job functions globally.

Machine learning is so extensive that you probably use it numerous times a day without knowing it. From unlocking your mobile phones using your face to giving your attendance using a biometric machine, machine learning is being used in almost every stage.

In this age of machine learning, every aspiring data scientist is expected to upskill themselves in machine learning techniques & tools and apply them to real-world business prob

Projects covered in this course

1. Customer Churn Prediction

A Bank wants to take care of customer retention for their product: savings accounts. The bank wants you to identify customers likely to churn balances below the minimum balance in the next quarter. You have the customers information such as age, gender, demographics along with their transactions with the bank. Your task as a data scientist would be to predict the propensity to churn for each customer.

4. Getting started with Decision Trees

What is a Decision Tree?

A Decision Tree is a flowchart like structure, where each node represents a decision, each branch represents an outcome of the decision, and each terminal node provides a prediction / label.

Why learn about Decision Trees?

- Decision Trees are the most widely and commonly used machine learning algorithms.
- Decision Trees can be used for solving both classification as well as regression problems.
- Decision Trees are robust to Outliers, so if you have Outliers in your data you can still build Decision Tree models without worrying about impact of Outliers on your model.
- Decision Trees are easy to interpret and hence have multiple applications in different industries.

5. Loan Prediction Practice Problem (Using Python)

About the course

This course is designed for people who want to solve binary classification problems. Classification is a skill every Data Scientist should be well versed in.

In this course, we are solving a real life case study of Dream Housing Finance. The company deals in all home loans. They have a presence across all urban, semi-urban and rural areas. Customers first apply for a home loan after that company validates the customer's eligibility. The company wants to automate the loan eligibility process (real-time) based on customer detail provided while filling online application form.

By the end of the course, you will have a solid understanding of Classification problem and Various approaches to solve the probem

6. Twitter Sentiment Analysis

What is Sentiment Analysis?

- Sentiment Analysis or Opinion Mining is a technique used to analyse the emotion in a text. We can extract the attitude or the opinion of a piece of text and get insights on it.
- In the context of machine learning, you can think of Sentiment Analysis as a Classification problem where the text can either have a positive sentiment, a negative sentiment or a neutral one.

Can I add this project to my resume and use it in my Interview?

- Sentiment Analysis is one of the most popular applications of Machine Learning and Classification in Natural language processing
- We also encourage you to take up more diverse datasets and apply sentiment analysis on them.
- Sentiment Analysis is also one of the first projects you would learn in your Natural language processing journey and as such is commonly asked in interviews.

7. Ensemble Learning and Ensemble Learning Techniques

A Comprehensive Course on Ensemble Learning

Ensemble learning is a powerful machine learning algorithm that is used across industries by data science experts. The beauty of ensemble learning techniques is that they combine the predictions of multiple machine learning models.

You must have used or come across several of these ensemble learning techniques in your machine learning journey:

- Bagging
- Boosting
- Stacking
- Blending, etc.

These ensemble learning techniques include popular machine learning algorithms such as XGBoost, Gradient Boosting, among others. You must be getting a good idea of how vast and useful ensemble learning can be!

Who is the Ensemble Learning and Ensemble Learning Techniques Course for?

This course is designed for anyone who:

- Wants to learn about Ensemble Learning in Machine Learning
- Wants to expand their current machine learning skillset
- Is a newcomer to Machine Learning
- Is looking to ace machine learning hackathons
- Is passionate about machine learning!

8. K-Nearest Neighbors (KNN) Algorithm in Python and R

Learn all about the K-Nearest Neighbor (KNN) Algorithm in Machine Learning

K-Nearest Neighbor (KNN) is one of the most popular machine learning algorithms. As a newcomer or beginner in machine learning, you'll find KNN to be among the easiest algorithms to pick up.

And despite its simplicity, KNN has proven to be incredibly effective at certain tasks in machine learning.

The KNN algorithm is simple to understand, easy to explain and perfect to demonstrate to a non-technical audience (that's why stakeholders love it!). That's a key reason why it's widely used in the industry and why you should know how the algorithm works.

Business Analyst

1. Introduction to Business Analytics

About Introduction to Business Analytics

Getting Started with Business Analytics

What is Business Analytics? Why has it become so popular recently? What are some of the popular applications of Business Analytics? And more importantly, how can you get started with learning Business Analytics from scratch?

With growth in digitisation, Business Analytics is ubiquitous right now. Organizations are splurging to integrate data science solutions in their daily processes. This is where they need Business Analysts.

Why pursue Business Analytics:

- Data is ubiquitous! Organizations need people who can use Business Analytics tools and techniques to make sense of this data.
- It is one of the hottest field in the industry right now
- There are so many Business Analytics tools and techniques which can be applied to solve business problems. Keep learning, keep growing!
- The potential of Business Analytics is limitless spanning across industries, roles and functions

2. Microsoft Excel: Formulas & Functions

Who is the Microsoft Excel: Formulas and Functions Course for?

This course is for anyone who:

- Wants to learn Microsoft Excel
- Wants to brush up their Excel skills, from beginner to intermediate
- Is looking to master Excel formulas and functions from basic to advanced

- Wants to get started with data analysis
- Is looking to start their business analytics or data science journey
- You'll find people at all levels in organizations pouring over Excel spreadsheets, from data analysts and business analysts to C-suite executives and data scientists.
- The one thing that has separated Excel from all other tools is the incredibly in-depth nature of the formulas and functions it offers. From arithmetic to logical functions, from Date and Time to Text functions, and of course, the marvellous LookUp functions (VLookUp and HLookUp) you'll need to have these handy when you're working on real-world analytics projects.

Tools For Data Science

1. Introduction to PyTorch for Deep Learning

PyTorch for Deep Learning - A Game Changing Deep Learning Framework

Welcome to the world of PyTorch - a deep learning framework that has changed and reimagined the way we build deep learning models.

PyTorch was recently voted as the favorite deep learning framework among researchers. It has left TensorFlow behind and continues to be the deep learning framework of choice for many experts and practitioners.

PyTorch is super flexible and is quite easy to grasp, even for deep learning beginners. If you work on deep learning and computer vision projects, you'll love working with PyTorch.

2. Introduction to Python

Why Python and how popular is it for Data Science?

- Python has rapidly become the go-to language in the data science space and is among the first things recruiters search for in a data scientist's skill set.
- It consistently ranks top in global data science surveys and its widespread popularity will
 only keep on increasing in the coming years.

• Over the years, with strong community support, this language has obtained a dedicated library for data analysis and predictive modelling.

This python data science course will help you learn Python libraries like Pandas and use them efficiently for data science and data analysis. Are you ready to power up your career and learn the best data science language?

3. Pandas for Data Analysis in Python

Learn Pandas - The Most Popular and Useful Python Library for Data Science

Pandas is one of the most popular Python libraries in data science. In fact, Pandas is among those elite libraries that draw instant recognition from programmers of all backgrounds, from developers to data scientists.

According to a recent survey by StackOverflow, Pandas is the 4th most used library/framework in the world. That is quite an achievement!

Pandas is the first library we import when we fire up our Jupyter notebooks ('import pandas as pd' is indelibly etched in our minds!). It is a super flexible tool that enables us to perform data analysis and data manipulation on Pandas dataframes in double-quick time.

4. Tableau for Beginners

Get Started with Tableau for Data Visualization, Analytics and Business Intelligence

Tableau is the gold standard in business intelligence, analytics and data visualization tools.

Tableau Desktop (and now Tableau Public) have transformed the way we interact with visualizations and tell data stories to our clients, stakeholders, and to non-technical audiences around the world.

Tableau has been recognized as a Leader in the Gartner Magic Quadrant for Analytics and Business Intelligence Platforms for 8 straight years. Here's Gartner's most recent ranking in 2020:

Do you need to know programming to learn Tableau?

Not at all. Tableau thrives as a drag-and-drop tool (for the most part). That's the beauty of Tableau to be honest, you can quickly get started and build awesome visualizations without having to get into any coding or programming.

But knowing simple Excel formulas, such as IF-ELSE, will help you with feature engineering in Tableau. And that is a critical part of a business intelligence analysts skillset.

What kind of projects can you perform using Tableau?

You can take up all sorts of analytics projects next. We suggest heading over to the <u>DataHack</u> <u>platform</u> and picking up any project that catches your interest. Load the dataset into Tableau and get going!

5. Convolutional Neural Networks (CNN) from Scratch

Learn about Convolutional Neural Networks (CNN) from Scratch

Convolutional Neural Networks, or CNN as they're popularly called, are the go-to deep learning architecture for computer vision tasks, such as object detection, image segmentation, facial recognition, among others. CNNs have even been extended to the field of video analysis!

If you are picking one deep learning architecture to learn and are not sure where to start, you should go for convolutional neural networks. Deep learning enthusiasts and experts with CNN knowledge are being widely sourced in the industry.

It's your time to use this CNN skillset and shine!