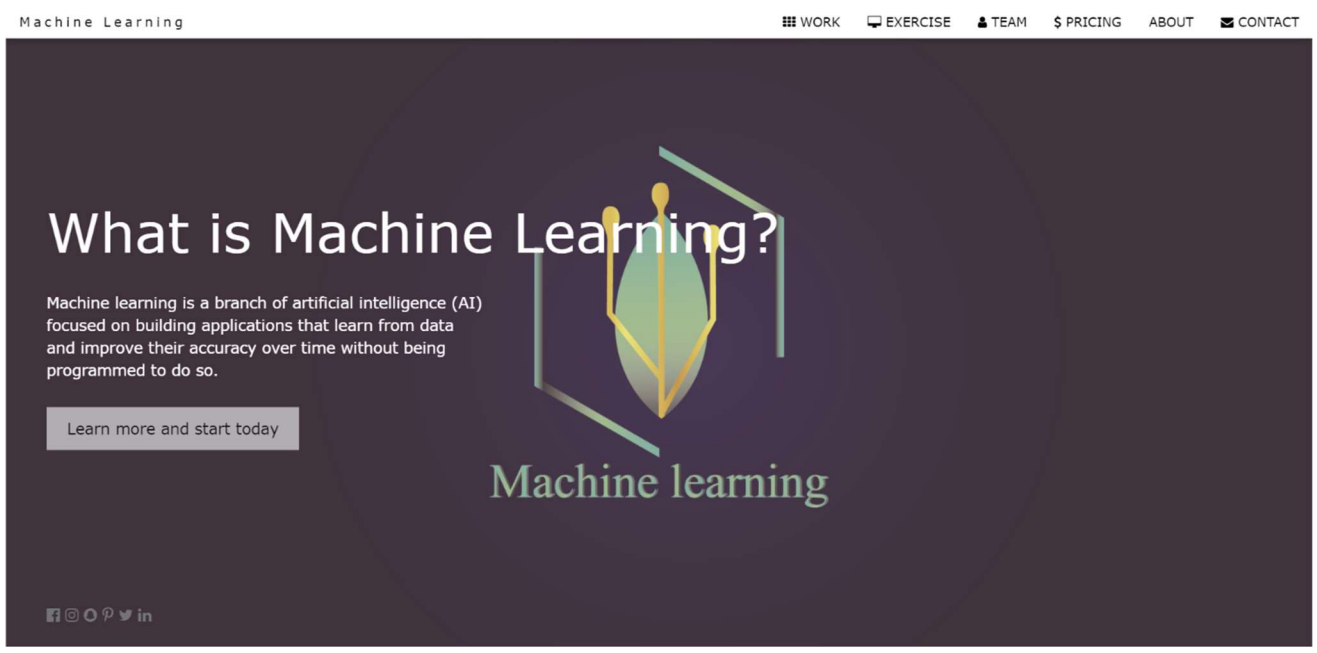
Project Machine Learning Website
11762 MUHAMMAD KASHIF
IICT 105915

Website Pages

Home



Evolution of machine learning

Because of new computing technologies, machine learning today is not like machine learning of the past. It was born from pattern recognition and the theory that computers can learn without being programmed to perform specific tasks; researchers interested in artificial intelligence wanted to see if computers could learn from data. The iterative aspect of machine learning is important because as models are exposed to new data, they are able to independently adapt. They learn from previous computations to produce reliable, repeatable decisions and results. It's a science that's not new – but one that has gained fresh momentum.
While many machine learning algorithms have been around for a long time, the ability to automatically apply complex mathematical calculations to big data – over and over, faster and faster – is a recent development. Here are a few widely publicized examples of machine learning applications you may be familiar with:

- The heavily hyped, self-driving Google car? The essence of machine learning.
- Online recommendation offers such as those from Amazon and Netflix? Machine learning applications for everyday life.
- Knowing what customers are saying about you on Twitter? Machine learning combined with linguistic rule creation.
- Fraud detection? One of the more obvious, important uses in our world today.

Benefits of Machine Learning

Most industries working with large amounts of data have recognized the value of machine learning technology. By gleaning insights from this data – often in real time – organizations are able to work more efficiently or gain an advantage over competitors.

Financial services

Banks and other businesses in the financial industry use machine learning technology for two key purposes: to identify important insights in data, and prevent fraud. The insights can identify investment opportunities, or help investors know when to trade. Data mining can also identify clients with high-risk profiles, or use cybersurveillance to pinpoint warning signs of fraud.

Government

Government agencies such as public safety and utilities have a particular need for machine learning since they have multiple sources of data that can be mined for insights. Analyzing sensor data, for example, identifies ways to increase efficiency and save money. Machine learning can also help detect fraud and minimize identity theft.

Health care

Machine learning is a fast-growing trend in the health care industry, thanks to the advent of wearable devices and sensors that can use data to assess a patient's health in real time. The technology can also help medical experts analyze data to identify trends or red flags that may lead to improved diagnoses and treatment.

Retail

Websites recommending items you might like based on previous purchases are using machine learning to analyze your buying history. Retailers rely on machine learning to capture data, analyze it and use it to personalize a shopping experience, implement a marketing campaign, price optimization, merchandise supply planning, and for customer insights.

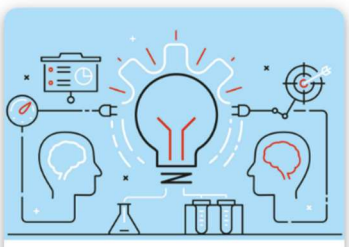
Oil and gas

Finding new energy sources. Analyzing minerals in the ground. Predicting refinery sensor failure. Streamlining oil distribution to make it more efficient and cost-effective. The number of machine learning use cases for this industry is vast – and still expanding.

Transportation

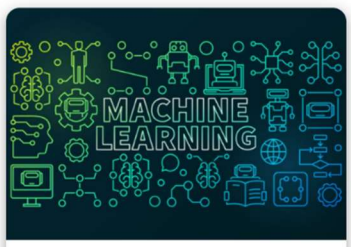
Analyzing data to identify patterns and trends is key to the transportation industry, which relies on making routes more efficient and predicting potential problems to increase profitability. The data analysis and modeling aspects of machine learning are important tools to delivery companies, public transportation and other transportation organizations.

Categories



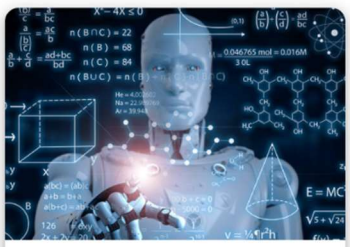
Beginner

This course is designed to introduce you to Machine Learning without needing any programming. That means that we don't cover the programming based machine learning tools like python and TensorFlow.



Inermediate

This Specialization from leading researchers at the University of Washington introduces you to the exciting, high-demand field of Machine Learning. Through a series of practical case studies, you will gain applied experience in major areas of Machine Learning including Prediction, Classification, Clustering, and Information Retrieval. You will learn to analyze large and complex datasets, create systems that adapt and improve over time, and build intelligent applications that can make predictions from data.



Advanced

The Cinque Terre (five lands) is a portion of the Italian Riviera. The coastline with five villages: Monterosso, Vernazza, Corniglia, Manarola, and Riomaggiore is a UNESCO World Heritage Site.

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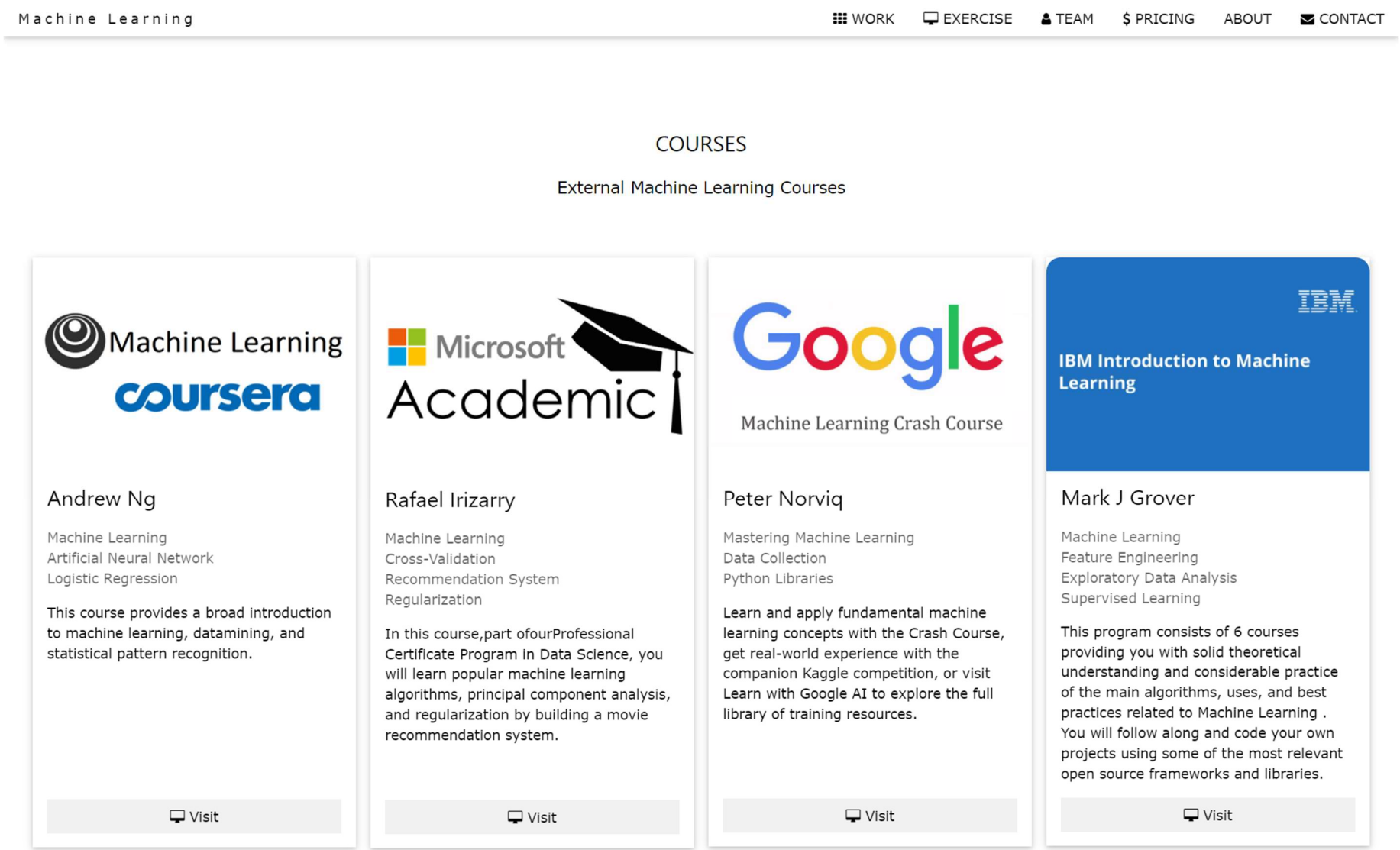
Work



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Exercise

Quiz Questions

Question 1.
1. What is true about Machine Learning?

- ○Machine Learning (ML) is that field of computer science
- ○ ML is a type of artificial intelligence that extract patterns out of raw data by using an algorithm or method.
- ○All of the above

Question 2.
ML is a field of AI consisting of learning algorithms that?

- ○Improve their performance
- ○At executing some task
- ○ All of the above

Question 3.
p → 0q is not a?

- ○hack clause
- ○horn clause
- ○structural clause

Question 4.

The action _____ of a robot arm specify to Place block A on block B.

- ○STACK(A,B)
- ○LIST(A,B)
- ○QUEUE(A,B)

Question 5.
A_____ begins by hypothesizing a sentence (the symbol S) and successively predicting lower level constituents until individual preterminal symbols are written.

- ○bottow-up parser
- ○top parser
- ○top-down parser

Grade Me **Clear**

Number of score out of 15 = **Score in percentage =**

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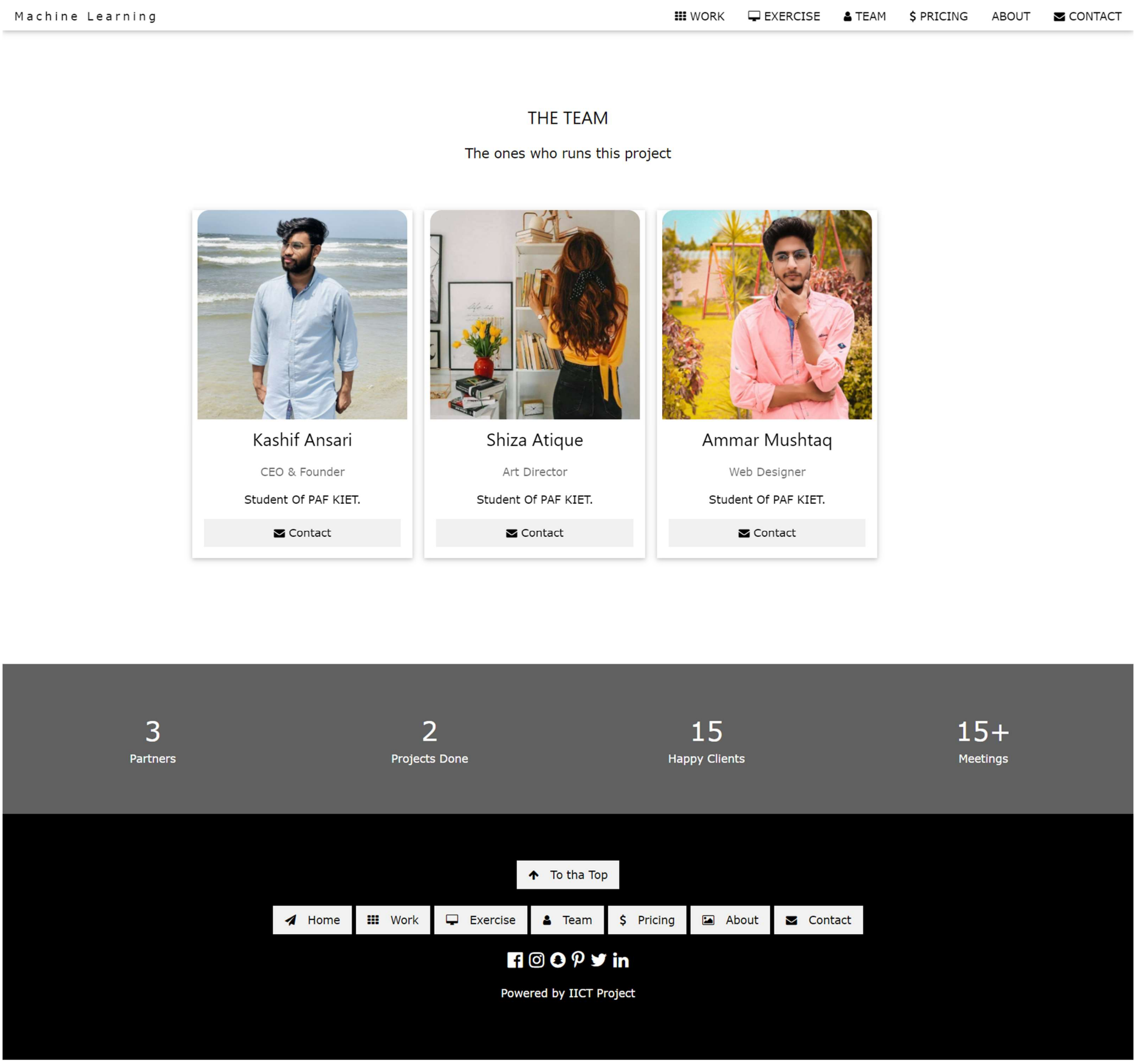
Team



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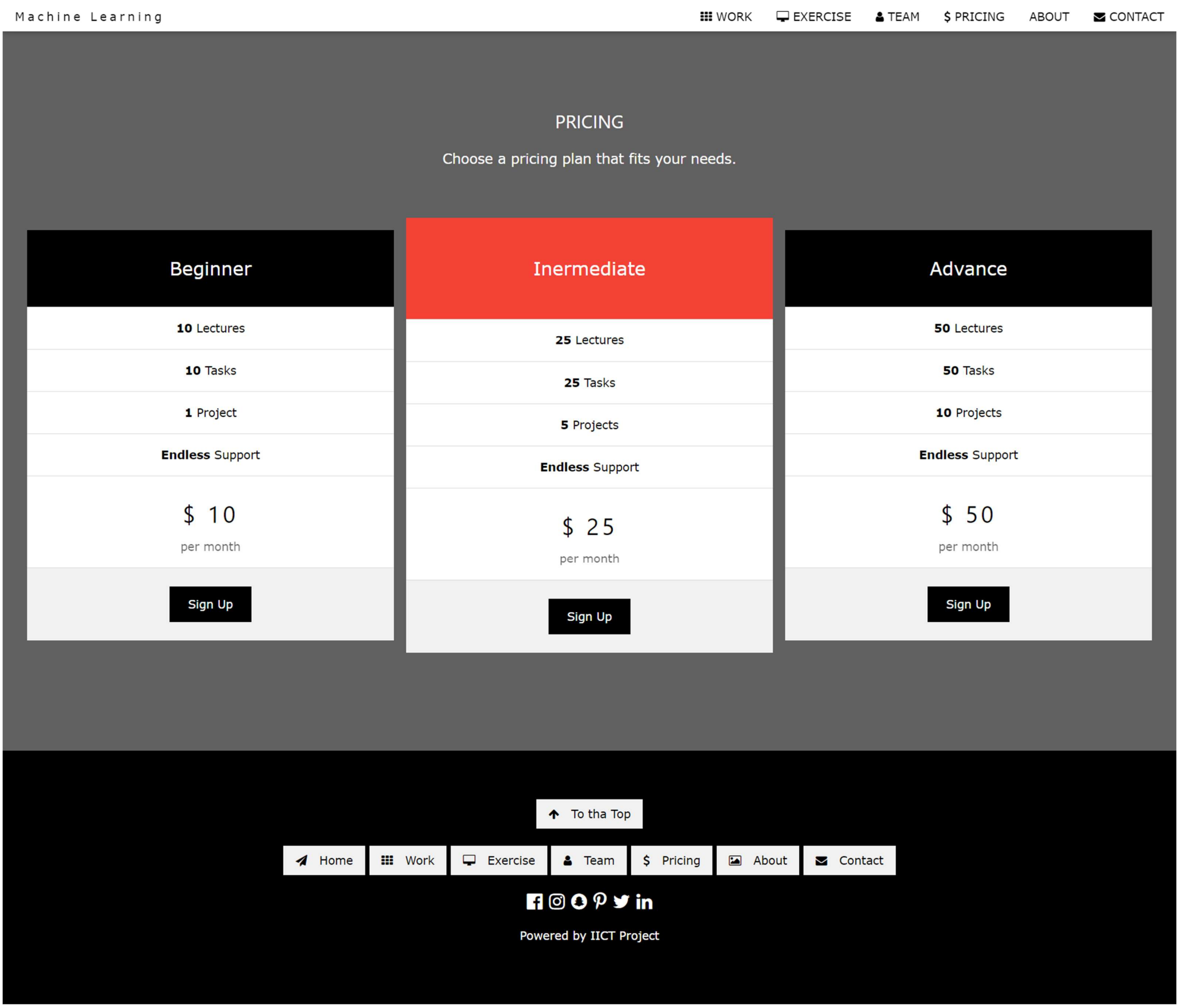
Pricing



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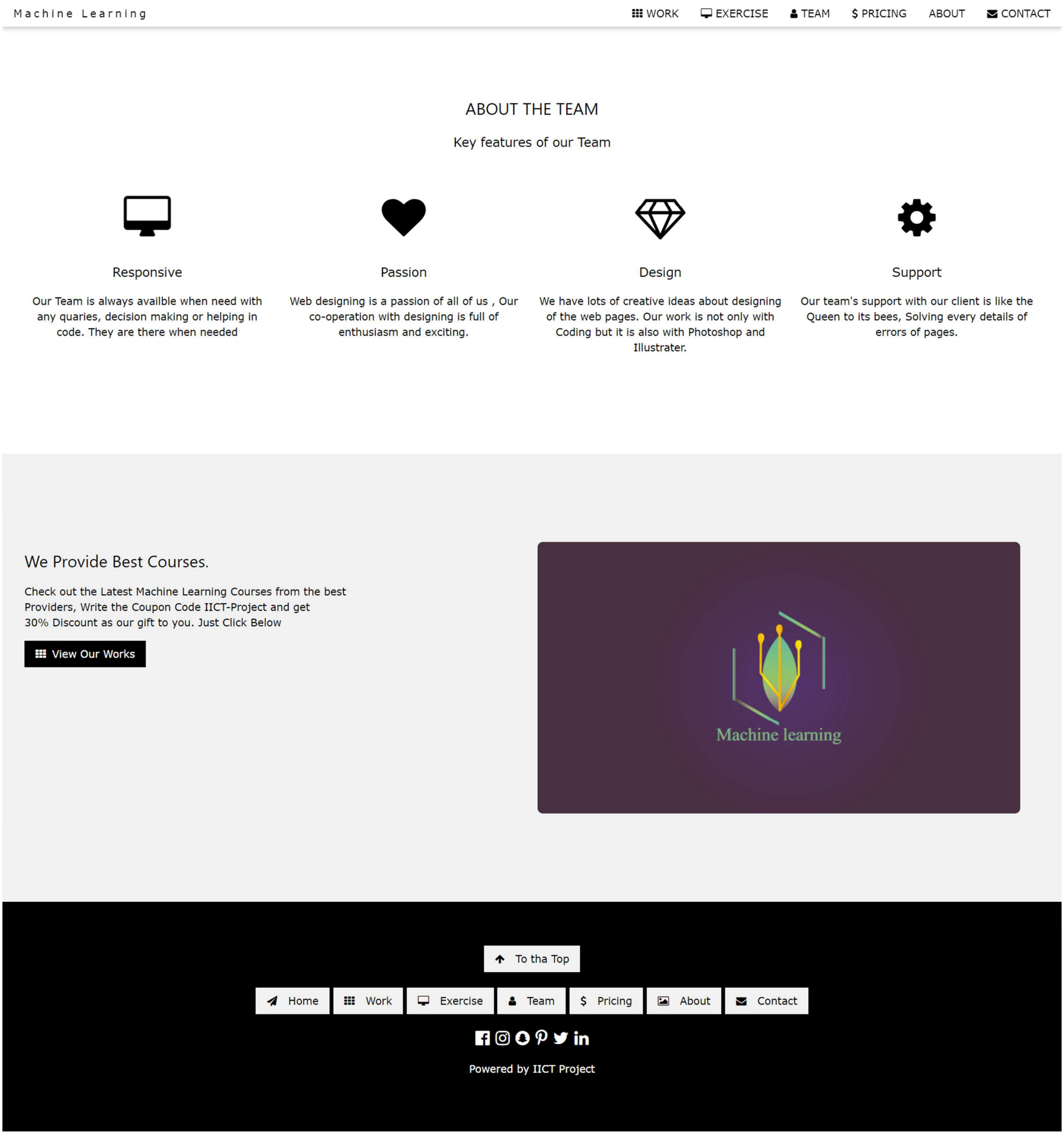
About



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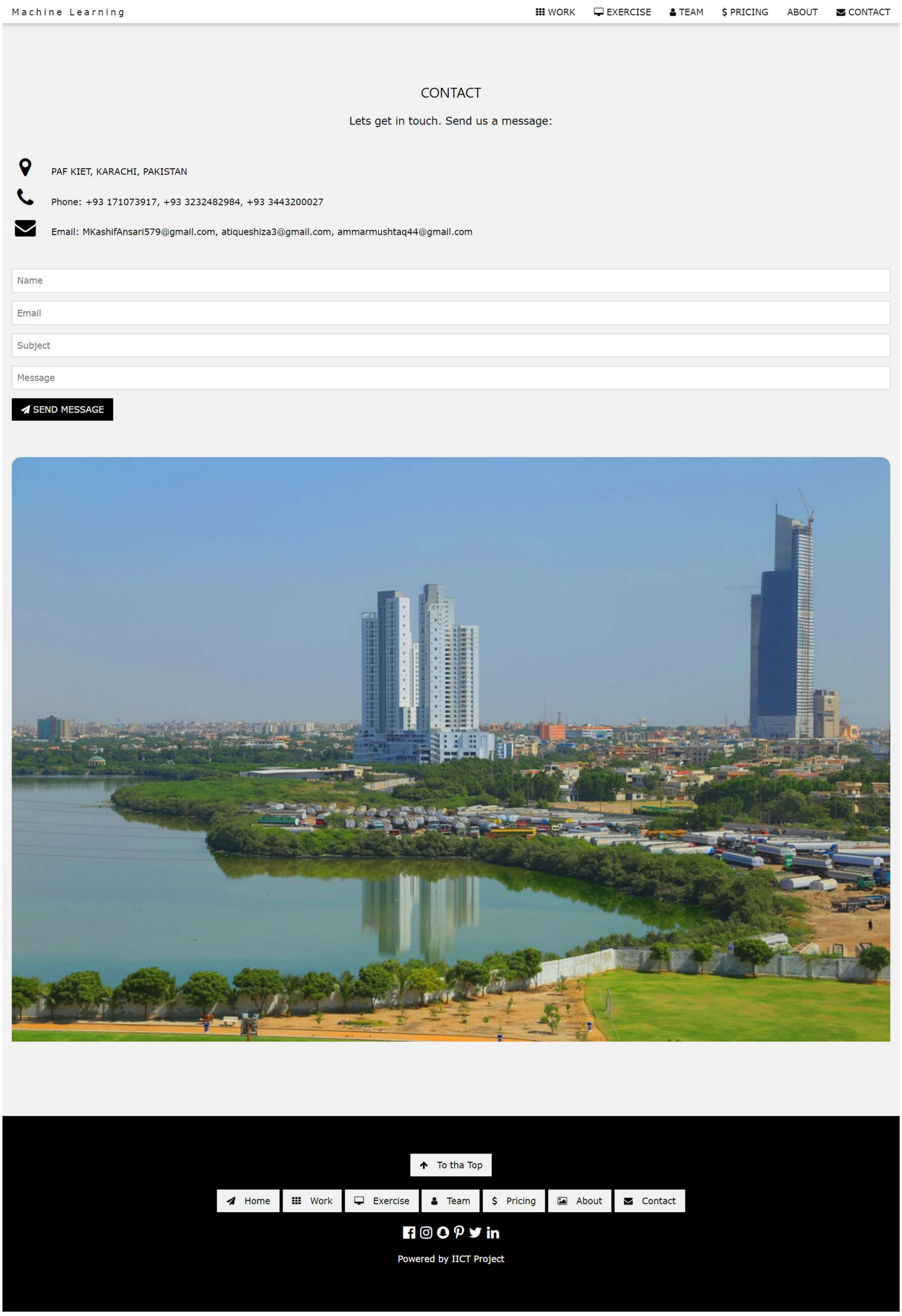
Contact



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About our Project Topic

Machine Learning

Machine learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention.

Evolution of machine learning

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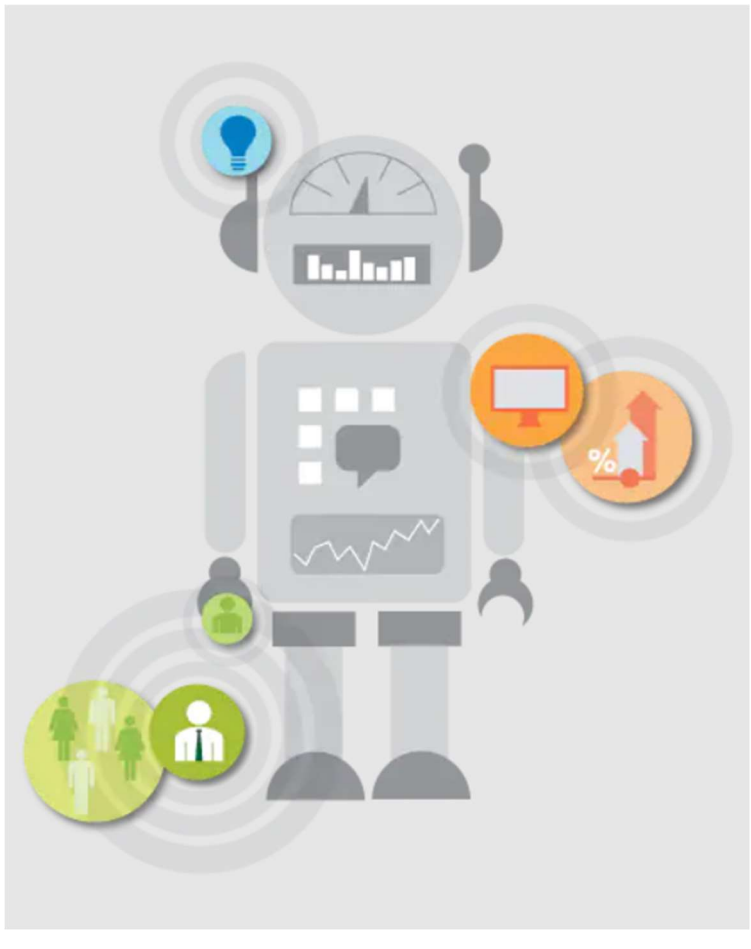
Why is machine learning important?

Resurging interest in machine learning is due to the same factors that have made data mining and Bayesian analysis more popular than ever. Things like growing volumes and varieties of available data, computational processing that is cheaper and more powerful, and affordable data storage.

All of these things mean it's possible to quickly and automatically produce models that can analyze bigger, more complex data and deliver faster, more accurate results – even on a very large scale. And by building precise models, an organization has a better chance of identifying profitable opportunities – or avoiding unknown risks.

What's required to create good machine learning systems?

- Data preparation capabilities.
- Algorithms – basic and advanced.
- Automation and iterative processes.
- Scalability.
- Ensemble modeling.



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What are some popular machine learning methods?

Two of the most widely adopted machine learning methods are **supervised learning** and **unsupervised learning** – but there are also other methods of machine learning. Here's an overview of the most popular types.

Supervised learning algorithms are trained using labelled examples, such as an input where the desired output is known. For example, a piece of equipment could have data points labelled either “F” (failed) or “R” (runs). The learning algorithm receives a set of inputs along with the corresponding correct outputs, and the algorithm learns by comparing its actual output with correct outputs to find errors. It then modifies the model accordingly. Through methods like classification, regression, prediction and gradient boosting, supervised learning uses patterns to predict the values of the label on additional unlabelled data. Supervised learning is commonly used in applications where historical data predicts likely future events. For example, it can anticipate when credit card transactions are likely to be fraudulent or which insurance customer is likely to file a claim.

Unsupervised learning is used against data that has no historical labels. The system is not told the "right answer." The algorithm must figure out what is being shown. The goal is to explore the data and find some structure within. Unsupervised learning works well on transactional data. For example, it can identify segments of customers with similar attributes who can then be treated similarly in marketing campaigns. Or it can find the main attributes that separate customer segments from each other. Popular techniques include self-organizing maps, nearest-neighbor mapping, k-means clustering and singular value decomposition. These algorithms are also used to segment text topics, recommend items and identify data outliers.

Semi supervised learning is used for the same applications as supervised learning. But it uses both labelled and unlabelled data for training – typically a small amount of labelled data with a large amount of unlabelled data (because unlabelled data is less expensive and takes less effort to acquire). This type of learning can be used with methods such as classification, regression and prediction. Semi supervised learning is useful when the cost associated with labelling is too high to allow for a fully labelled training process. Early examples of this include identifying a person's face on a web cam.

Reinforcement learning is often used for robotics, gaming and navigation. With reinforcement learning, the algorithm discovers through trial and error which actions yield the greatest rewards. This type of learning has three primary components: the agent (the learner or decision maker), the environment (everything the agent interacts with) and actions (what the agent can do). The objective is for the agent to choose actions that maximize the expected reward over a given amount of time. The agent will reach the goal much faster by following a good policy. So the goal in reinforcement learning is to learn the best policy.

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How it works

To get the most value from machine learning, you have to know how to pair the best algorithms with the right tools and processes. SAS combines rich, sophisticated heritage in statistics and data mining with new architectural advances to ensure your models run as fast as possible – even in huge enterprise environments.

Algorithms: SAS graphical user interfaces help you build machine learning models and implement an iterative machine learning process. You don't have to be an advanced statistician. Our comprehensive selection of machine learning algorithms can help you quickly get value from your big data and are included in many SAS products. SAS machine learning algorithms include:

Neural networks	**Local search optimization techniques (e.g., genetic algorithms)**
Decision trees	**Expectation maximization**
Random forests	**Multivariate adaptive regression splines**
Associations and sequence discovery	**Bayesian networks**
Gradient boosting and bagging	**Kernel density estimation**
Support vector machines	**Principal component analysis**
Nearest-neighbor mapping	**Singular value decomposition**
k-means clustering	**Gaussian mixture models**
Self-organizing maps	**Sequential covering rule building**

Tools and Processes: As we know by now, it’s not just the algorithms. Ultimately, the secret to getting the most value from your big data lies in pairing the best algorithms for the task at hand with:

Comprehensive data quality and management	**Automated ensemble model evaluation to identify the best performers**
GUIs for building models and process flows	**Easy model deployment so you can get repeatable, reliable results quickly**
Interactive data exploration and visualization of model results	**An integrated, end-to-end platform for the automation of the data-to-decision process**
Comparisons of different machine learning models to quickly identify the best one	