Welcome! We will begin shortly

Live Virtual Class

Intro to the World of AI

Learning Outcomes

- Understand the key terminologies in the World of AI
- Understand how these key terminologies are connected
- Gain an understanding of the Artificial Intelligence landscape

Guidelines

Listen only mode

Ask questions at the interest of the larger audience

FAQ

Questions in the Q&A Box

Thank you

Kindly utilize the chat box for subject-relevant questions only to maximize your learnings from the session.

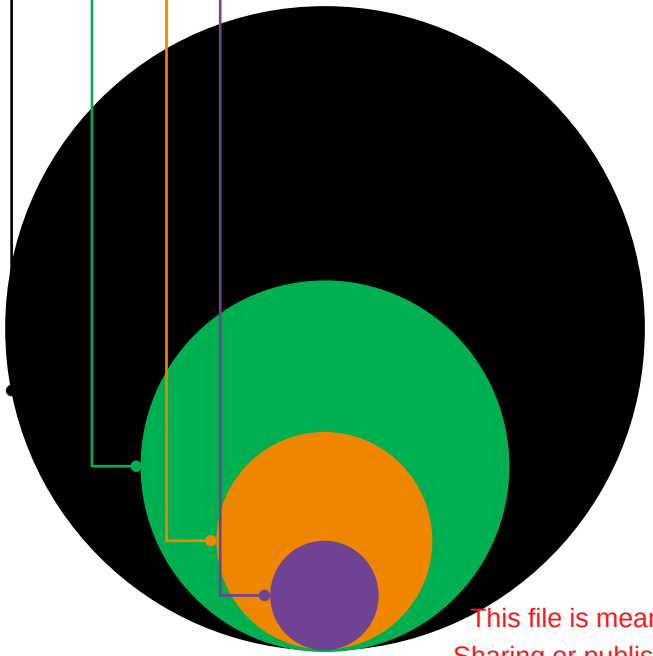
Key Terminologies in The World of Data

Artificial Intelligence *Machine that mimics human intelligence & behaviour*

Machine Learning *Machine that learns from the data automatically w.r.t a particular task and performance measure*

Deep Learning *Subset of ML, learning happens via algorithms inspired by neural networks in human brain*

Generative AI *Subset of DL, creating new content from existing ones using advanced algorithms*



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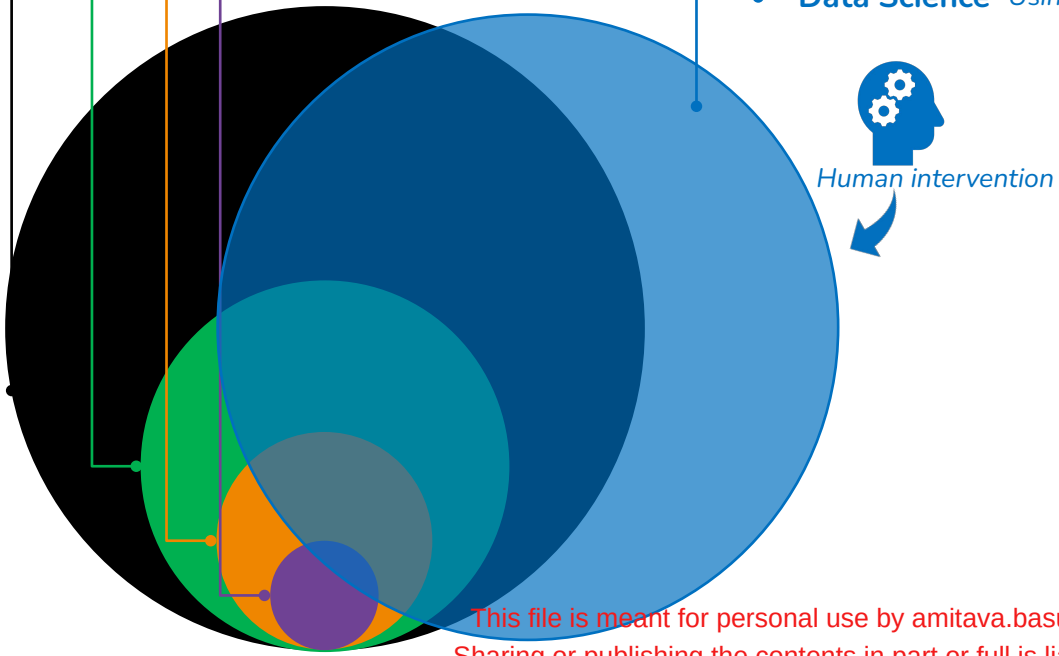
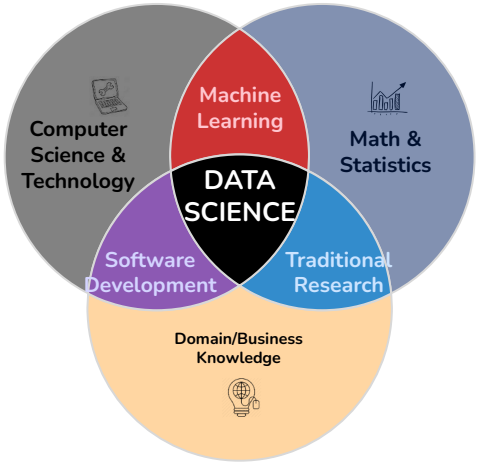
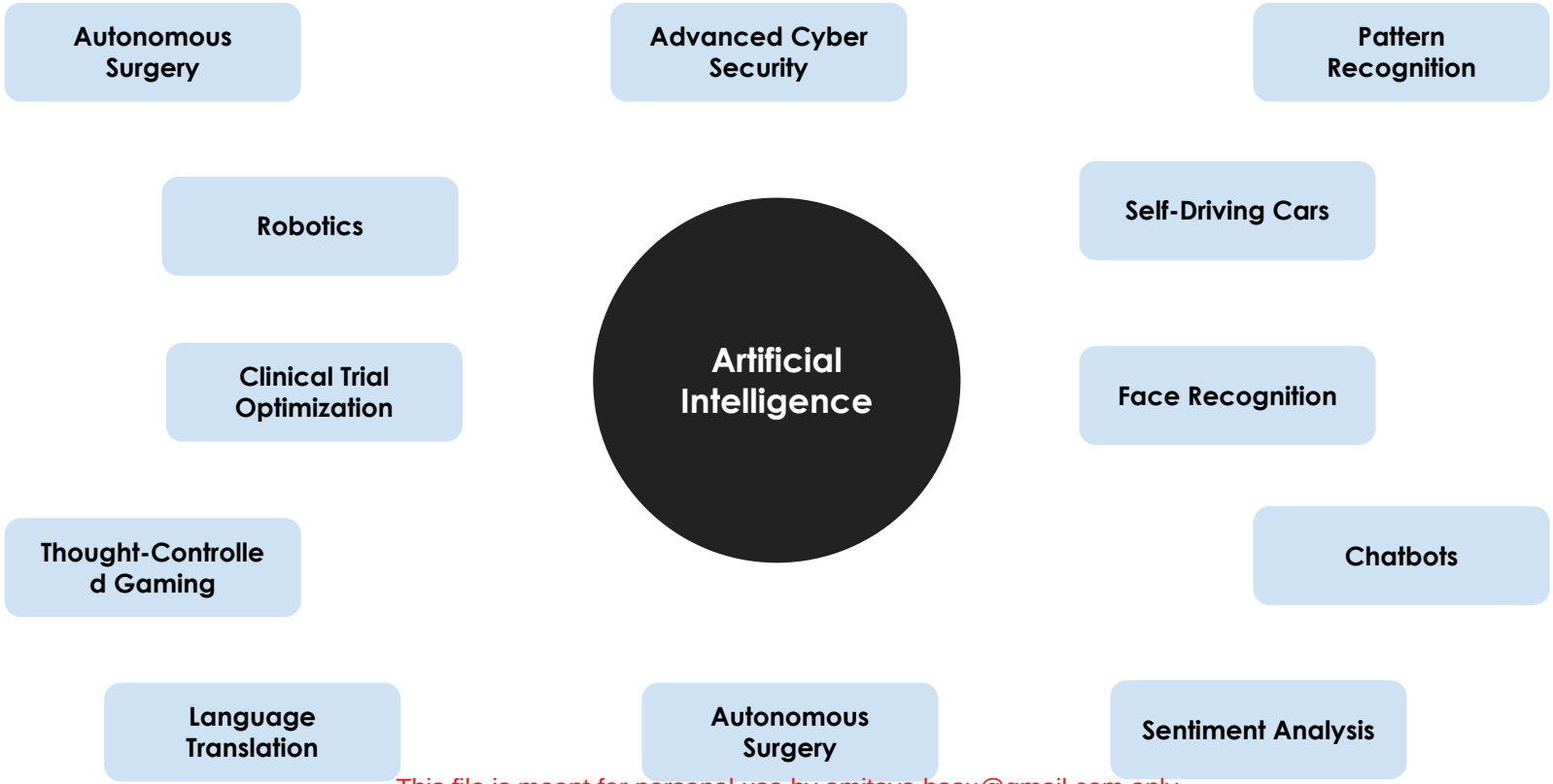
Data Science *Using AI to enable data driven decision making*





What is Artificial Intelligence?



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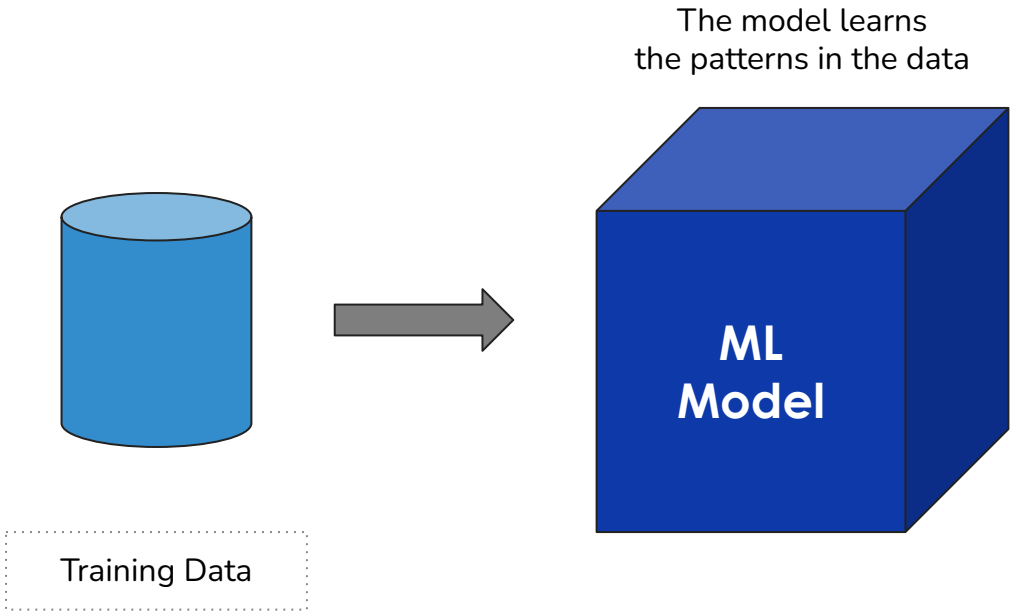

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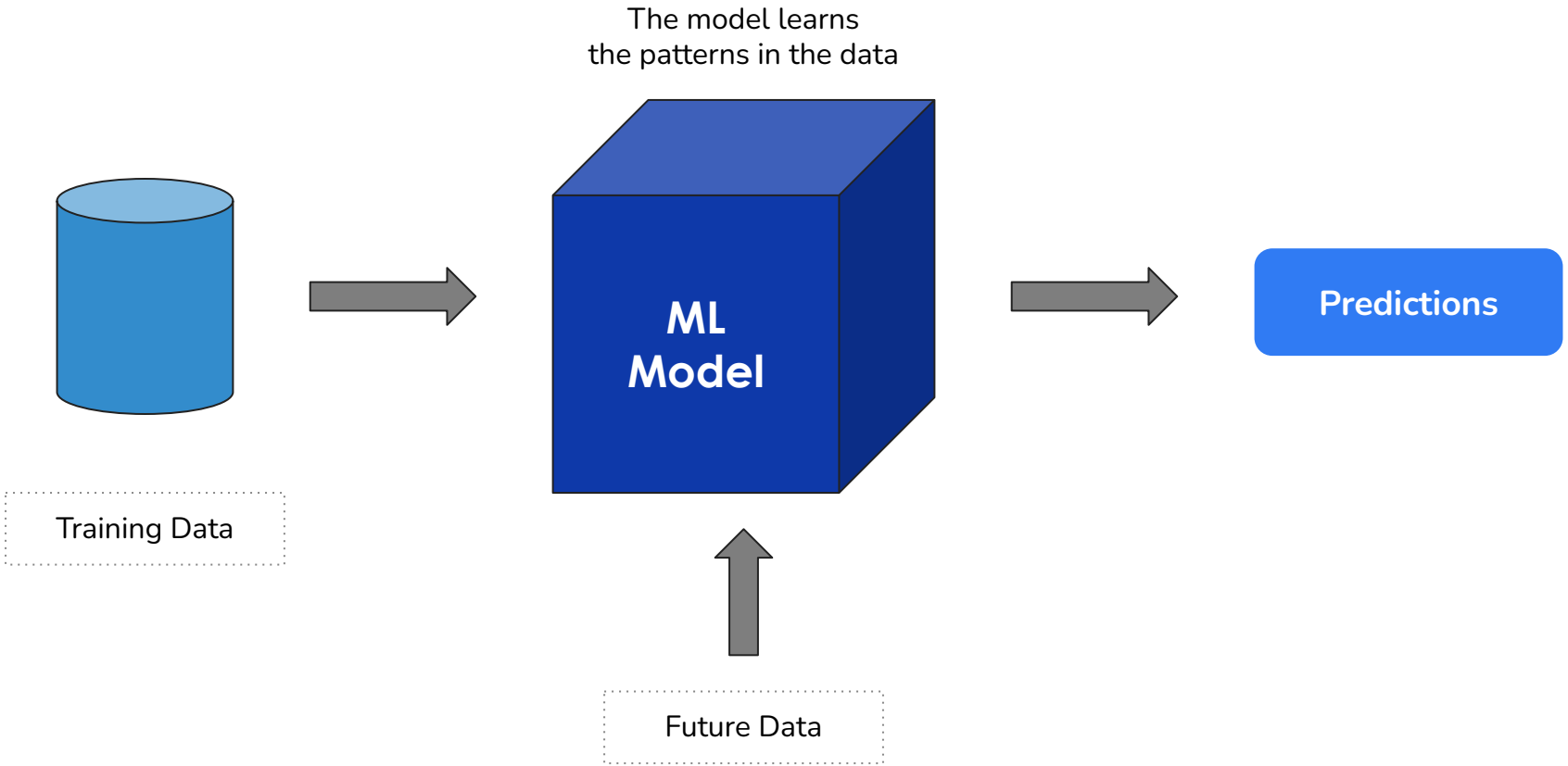
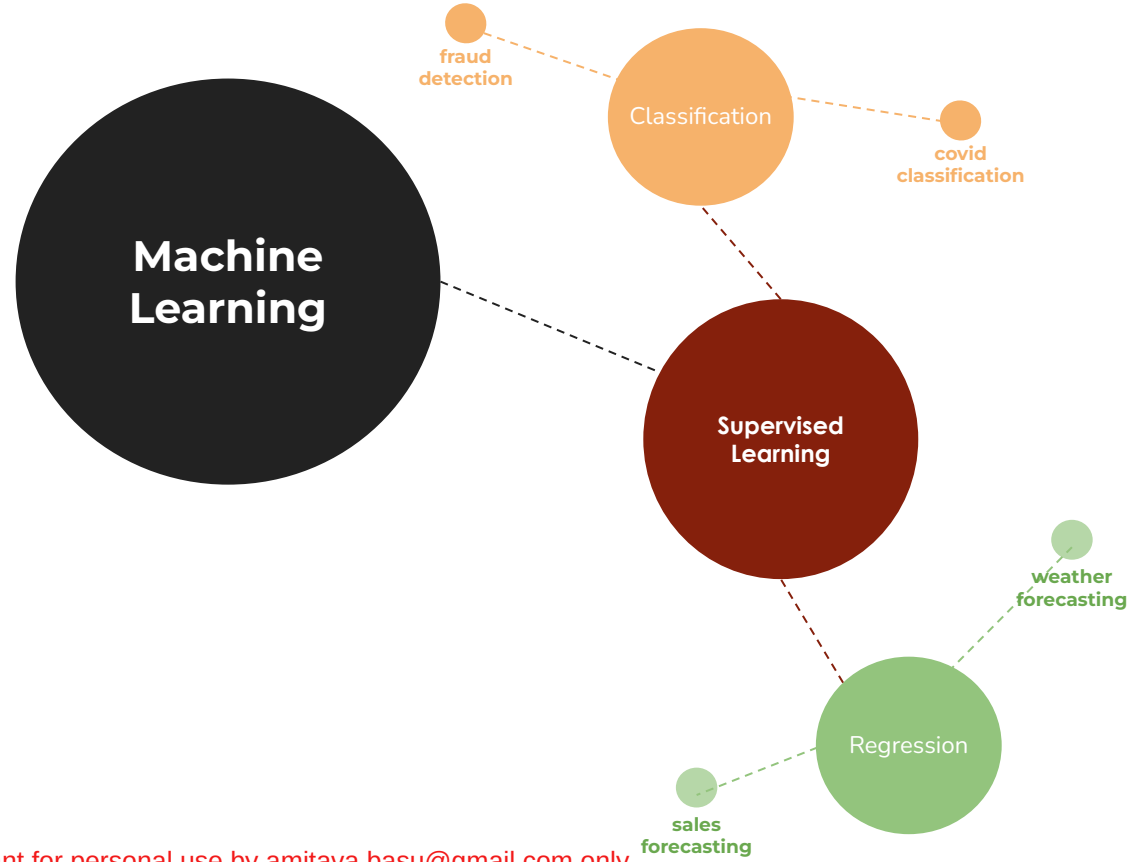


Types of Machine Learning



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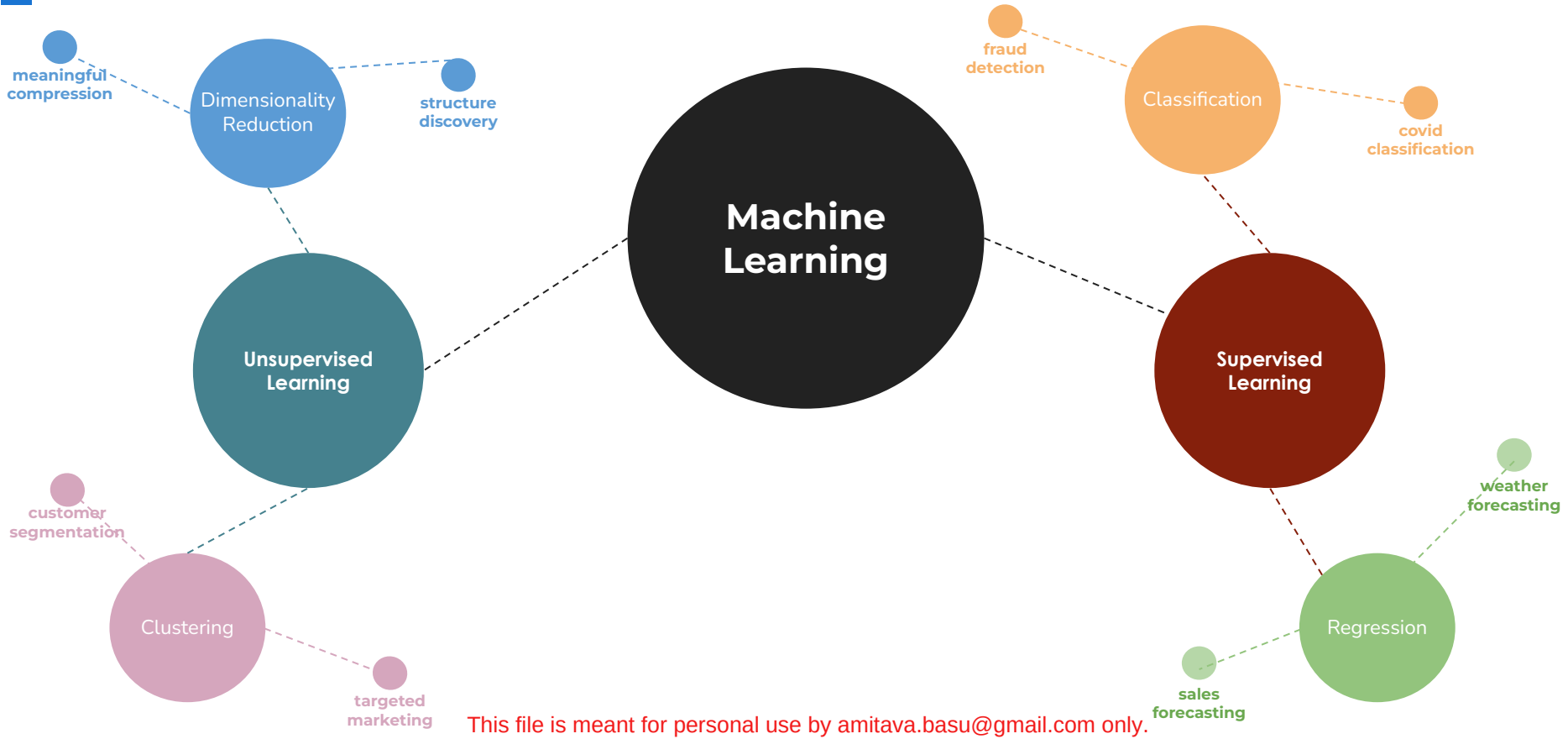

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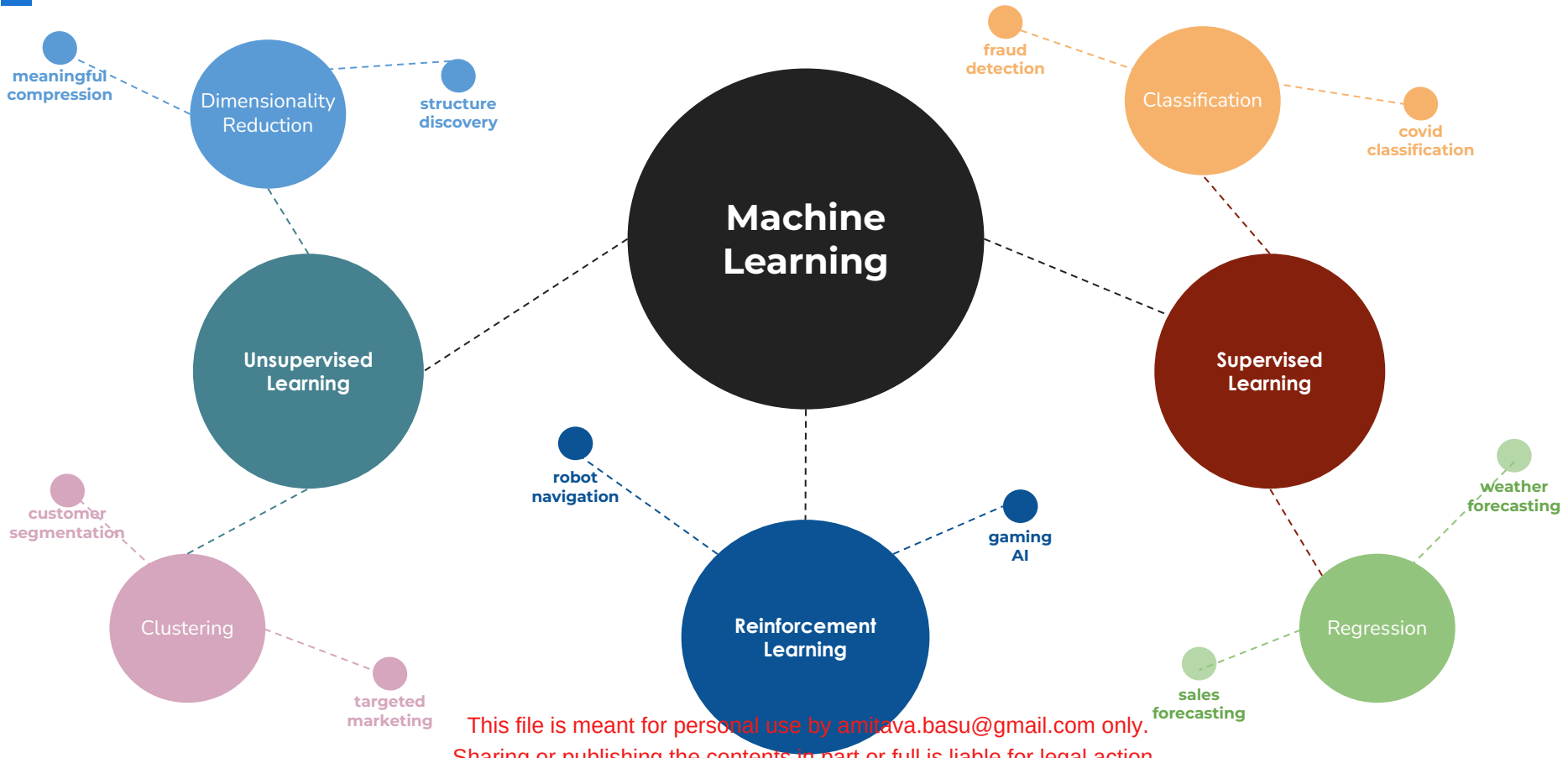
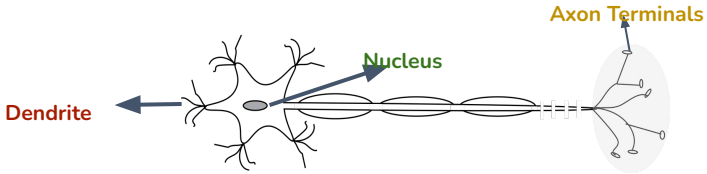
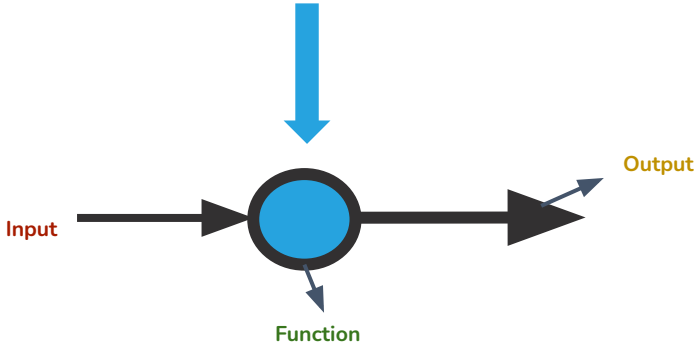


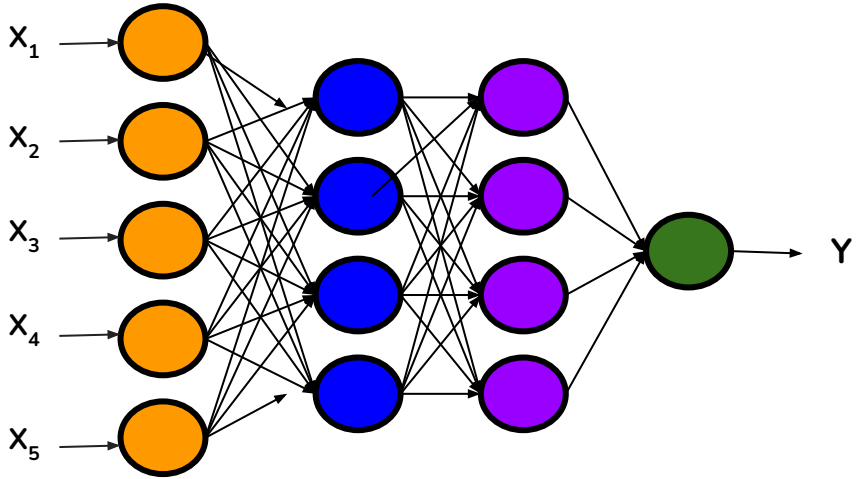
What is Deep Learning (DL)?



Biological Neuron



Artificial Neuron



Artificial Neural Network

Types of AI

Train

Model

Learns from relationship between **labels** and data

Could this be a dog?

Classify

Discriminative AI

Train

Model

Learns from patterns in large amounts of unstructured data

Create an image of dog, having fun in a party, wearing a black tuxedo with wine in one hand

Generate

Generative AI

Other images on the internet

Data Quiz

Which of the following are examples of the computational paradigm of Data Science?

A. Effectiveness of a new medication through randomized trial

B. Weather forecasting based on historical and weather patterns

C. Impact of a new policy on citizens

D. Optimize routing of vehicles to minimize costs

Data Quiz

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Data Quiz

Effectiveness of a new medication through randomized trial	New medications are tested in a very controlled manner and amongst a specific, predetermined group to ensure that the we get a clear understanding of the effects and side-effects of the medications before rolling them out for large-scale production
Weather forecasting based on historical and weather patterns	Weather forecasting systems now use data from a variety of sources (like weather stations, satellites, etc), assimilate the data, and then use efficient computationally powerful mechanisms to provide accurate forecasts
Impact of a new policy on citizens	Impact of new policies on citizens is also conducted in an experimental format with careful considerations and comparative analysis to ensure that we arrive at the right decisions that would optimize the preset goals
Optimize routing of vehicles to minimize costs	Vehicle routes are optimized by taking into consideration a large number of factors (like geographical data, traffic data, etc.), identifying the constraints, and running computationally powerful algorithms to establish the most cost-effective route

Data Quiz

In World War II, which group of mathematicians played a crucial role in breaking German encryption codes?

A. The Codebreakers

B. The Enigma Team

C. The Los Alamos Group

D. The Navajo Code Talkers

Data Quiz

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Data Quiz

The Codebreakers	A diverse group of mathematicians, cryptographers, and intelligence personnel who played a pivotal role in breaking complex codes and ciphers during World War II. They helped decipher encrypted messages and provided invaluable intelligence that contributed to Allied victories.
The Enigma Team	Enigma was a complex electro-mechanical device used by the German military during World War II to encrypt and decrypt secret messages. The machine's encryption was broken by Alan Turing and team, resulting in a significant intelligence advantage for the Allies and contributing to their eventual victory.
The Los Alamos Group	Stanislaw Ulam and his group of mathematicians at Los Alamos National Laboratory made substantial contributions to computational methods, including Monte Carlo simulations, which have become fundamental techniques in statistical analysis and machine learning.
The Navajo Code Talkers	A group of Native American soldiers who played the role of code talkers in World War II, using the Navajo language to create an unbreakable code. They were instrumental in securing military communications and contributing to Allied success

Data Quiz

In 2011, IBM's AI system competed on the quiz show Jeopardy! and defeated human champions. What was the name of this AI system?

A. Deep Blue

B. Watson

C. AlphaGo

D. HAL 9000

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Data Quiz

Deep Blue	A supercomputer developed by IBM that gained worldwide recognition for defeating reigning world chess champion, Garry Kasparov, in a six-game chess match in 1997. The victory marked a significant milestone in the field of AI, showcasing the potential of machine intelligence in complex strategic games.
Watson	An advanced AI system developed by IBM that showcased its ability to understand and process natural language and provide accurate answers to complex questions. It's capabilities have since been applied in various fields, including healthcare, finance, and customer service.
AlphaGo	An AI program developed by DeepMind, a subsidiary of Alphabet Inc. that made headlines in 2016 when it defeated the world champion Go player, Lee Sedol, in a five-game match. The success showcased the potential of AI in surpassing human expertise in strategic decision-making.
HAL 9000	A fictional sentient computer system designed to assist and manage operations on a spacecraft. It's malfunction and subsequent conflicts with the human crew highlight potential risks and ethical dilemmas associated with advanced AI

Data Quiz

Which of the following are examples of cloud computing services?

A. Amazon Web Services

B. Hadoop

C. Microsoft Azure

D. Apache Spark

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Data Quiz

Amazon Web Services	A cloud computing platform offered by Amazon. It provides a wide range of cloud-based services, including computing power, databases, analytics, machine learning, and more, enabling businesses and individuals to build, deploy, and manage applications on the cloud.
Hadoop	An open-source framework that enables distributed processing and storage of large datasets across clusters of computers. It provides a scalable and cost-effective solution for processing and analyzing big data.
Microsoft Azure	A cloud computing platform offered by Microsoft. It provides a wide range of cloud-based services, including virtual machines, storage, databases, AI, analytics, and more, enabling businesses to build, deploy, and manage applications and services with flexibility and scalability on the cloud.
Apache Spark	An open-source distributed computing system designed for processing and analyzing large-scale datasets. It provides a fast and flexible framework for in-memory data processing, supporting a wide range of applications on big data analytics.

Data Quiz

How is Edge Computing beneficial?

A. reduces network latency and improves real-time data processing

B. centralizes data storage and enhances data security

C. eliminates the need for internet connectivity and reduces data transmission costs

D. increases scalability and enables seamless integration with cloud services

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Data Quiz

reduces network latency and improves real-time data processing

The primary benefit of edge computing is its ability to process data closer to the source, reducing the time it takes for data to travel back and forth between the source and a centralized cloud or data center. This leads to lower network latency, enabling faster real-time data processing and decision-making.

centralizes data storage and enhances data security

While edge computing can involve local storage for temporary caching or quick access, it is not primarily aimed at centralizing data storage. Data security can be improved by reducing data transmission and minimizing exposure to external networks, but it is not the primary purpose of edge computing.

eliminates the need for internet connectivity and reduces data transmission costs

While edge computing can reduce the amount of data that needs to be transmitted to a centralized cloud or data center, it does not eliminate the need for internet connectivity altogether. It typically requires some form of internet connectivity to exchange data with other systems or to access cloud resources.

increases scalability and enables seamless integration with cloud services

Edge computing can complement cloud services by offloading some processing tasks closer to the edge, but it does not directly enable seamless integration with cloud services.

Data Quiz

Which of the following statements is NOT a feature of Blockchain?

A. Centralization

B. Immutability

C. Security

D. Transparency

Data Quiz

Great Learning
POWER AHEAD

Which of the following statements is NOT a feature of Blockchain?

A. Centralization

B. Immutability

C. Security

D. Transparency

Data Quiz

Centralization	Blockchain operates on a decentralized network, eliminating the need for a central authority or intermediary. This distributed nature enhances transparency, security, and resilience by allowing multiple participants to validate and maintain the integrity of the shared ledger.
Immutability	Once data is recorded on the blockchain, it becomes nearly impossible to alter or tamper with. Each transaction or data entry is linked to previous ones through cryptographic hashes, creating an immutable chain of information, that enhances the trustworthiness and integrity of the data stored.
Security	Blockchain employs advanced cryptographic techniques to ensure the security and integrity of data. Each transaction is digitally signed and encrypted, and the decentralized consensus mechanism prevents unauthorized modifications.
Transparency	All participants in a blockchain network can view and access the entire transaction history stored on the blockchain. This transparency fosters trust among network participants, as they can independently verify and validate transactions.

Data Quiz

Which of the following is a practical application of supervised learning?

A. Dividing the customers of an e-commerce platform into different segments

B. Visualizing high-dimensional equipment sensor data in lower dimensions

C. Predicting the price of a used car based on the attributes of the car

D. Predicting the likelihood of a hotel reservation getting cancelled

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Data Quiz

Dividing the customers of an e-commerce platform into different segments	Customers can be segmented into different categories based on their purchase and demographic attributes using unsupervised learning techniques like clustering algorithms.
Visualizing high-dimensional equipment sensor data in lower dimensions	High-dimensional data can be efficiently brought down to lower dimensions (2 or 3) for visualization purposes using unsupervised learning techniques, like PCA and t-SNE, while retaining the most important information.
Predicting the price of a used car based on the attributes of the car	Algorithms from a subset of supervised learning, called regression, can be trained using historical data containing attributes like mileage, horsepower, manufacture year, distance driven, and more to determine the price of a used car
Predicting the likelihood of a hotel reservation getting cancelled	Algorithms from a subset of supervised learning, called classification, can be trained using historical data containing attributes like reservation lead time, room price, no. of guests, and more to determine the likelihood of cancellation

Data Quiz

Which of the following is LEAST LIKELY to be the output of a generative AI model?

A. A presentation for a lecture on data science based on provided instructions regarding content, audience, and session duration

B. Answers to questions regarding a popular tourist spot based on an images of the spot

C. A portrait of the Leaning Tower of Pisa with artistic features of a Leonardo da Vinci painting

D. Identifying whether a customer is likely to default on loan repayment based on credit history and other financial attributes

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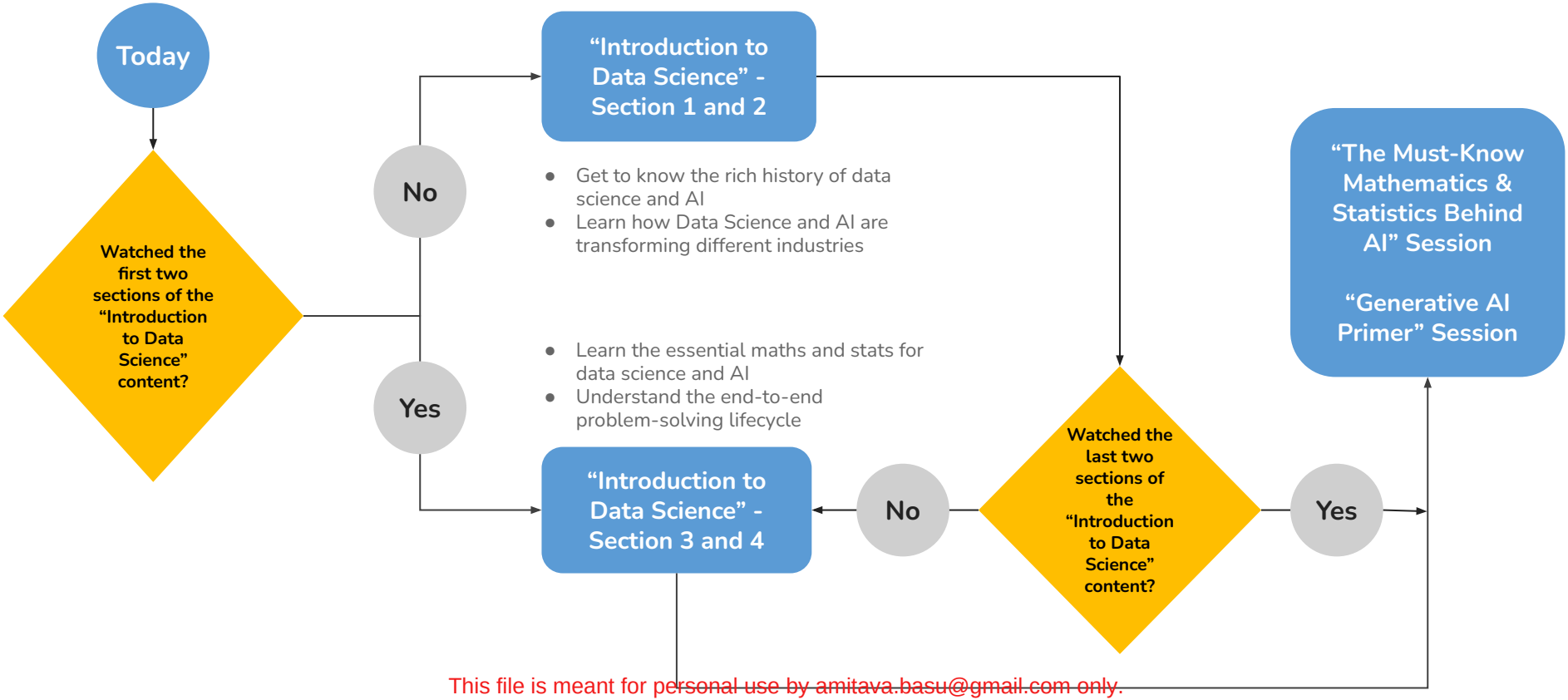
Data Quiz

A presentation for a lecture on data science based on provided instructions regarding content, audience, and session duration	Generative AI models understand the relationship between instructions and presentation content by first learning from a collection of existing presentations and their instructions. They then 'decode' new instructions to generate relevant content.
Answers to questions regarding a popular tourist spot based on an images of the spot	The model first analyzes the visual features of the image (computer vision), then understands the question (natural language processing), and then generates a relevant answer based on its understanding of the image and the question
A portrait of the Leaning Tower of Pisa with artistic features of a Leonardo da Vinci painting	Generative AI models can transfer artistic styles between different image by identifying the underlying patterns. These style transfer abilities allow for the transformation of an image to adopt the artistic style of another image.
Identifying whether a customer is likely to default on loan repayment based on credit history and other financial attributes	Problems like the prediction of likelihood of loan repayment default are effectively dealt with by discriminative AI algorithms. They are generally more robust in these type of tasks as they learn the decision boundaries directly.

QnA

Next Steps



Thank you!

We'd love to hear your feedback!
Please share your feedback for the session

Wish you all the very best!

Please feel free to raise a Support Request through Olympus in case of any queries