

Welcome! We will begin shortly



Getting Started with Generative AI

Learning Outcomes

- Understand the role of Generative AI in business and its distinction from other AI paradigms.
- Explore different GenAI models and their applications across various industries.
- Implement GenAI to enhance automation, decision-making, and operational efficiency.

Guidelines



Listen only mode



Ask questions at the interest
of the larger audience



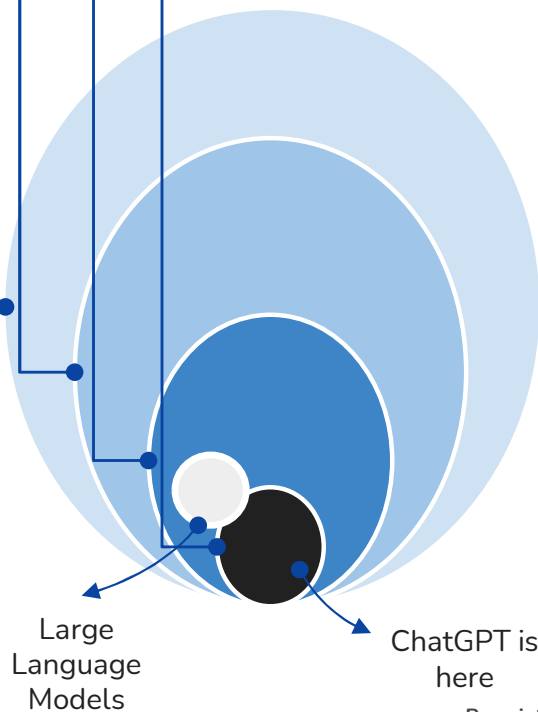
Questions in the
Q&A Box

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 w.r.t a particular task and performance measure*
- **Deep Learning** *Subset of ML, learning happens via algorithms inspired by neural networks in the human brain*
- **Generative AI** *Subset of DL, creating new data instances by learning the training data*



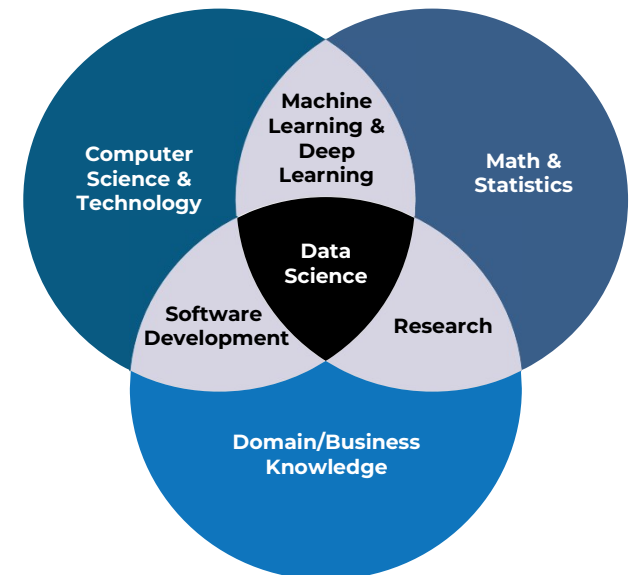
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- **Generative AI** *Subset of DL, creating new data instances by learning the training data*
- **Data Science** *Using AI to enable data driven decision making*

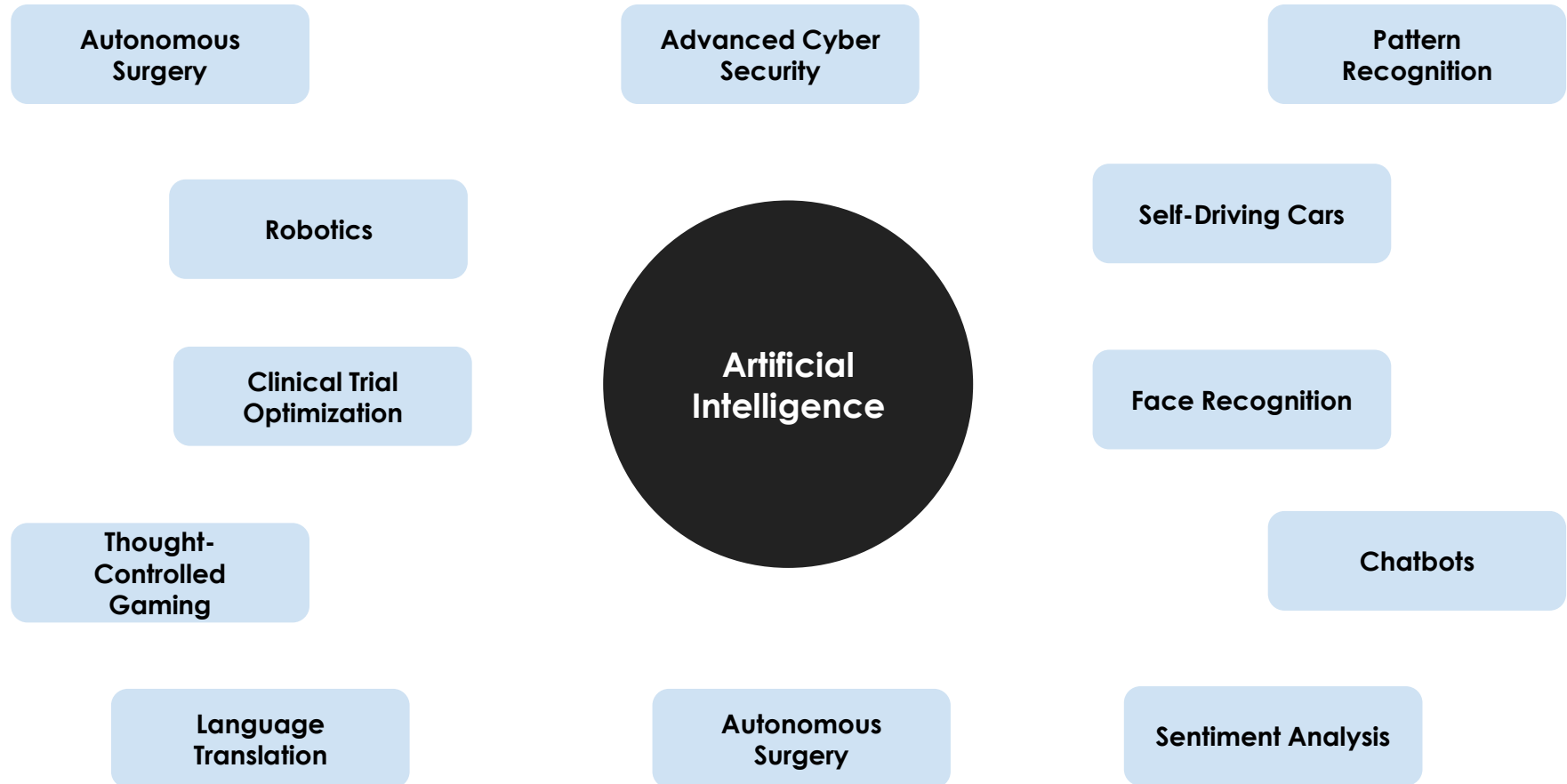


Large Language Models

ChatGPT is here

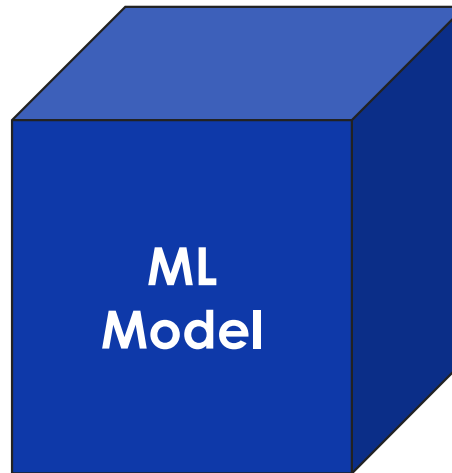
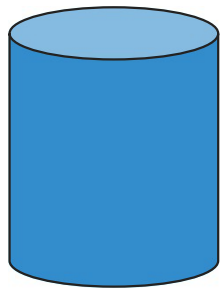


Applications of Artificial Intelligence (AI)



What is Machine Learning (ML)?

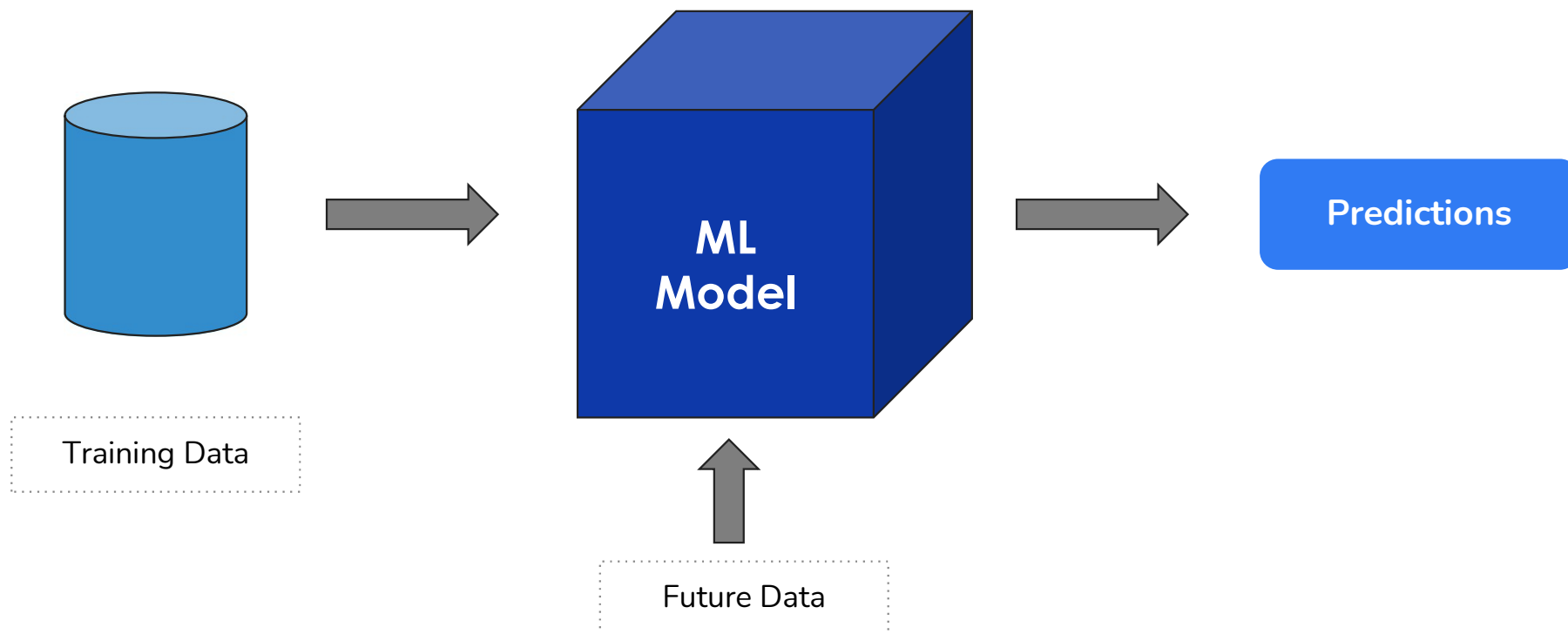
The model learns
the patterns in the data



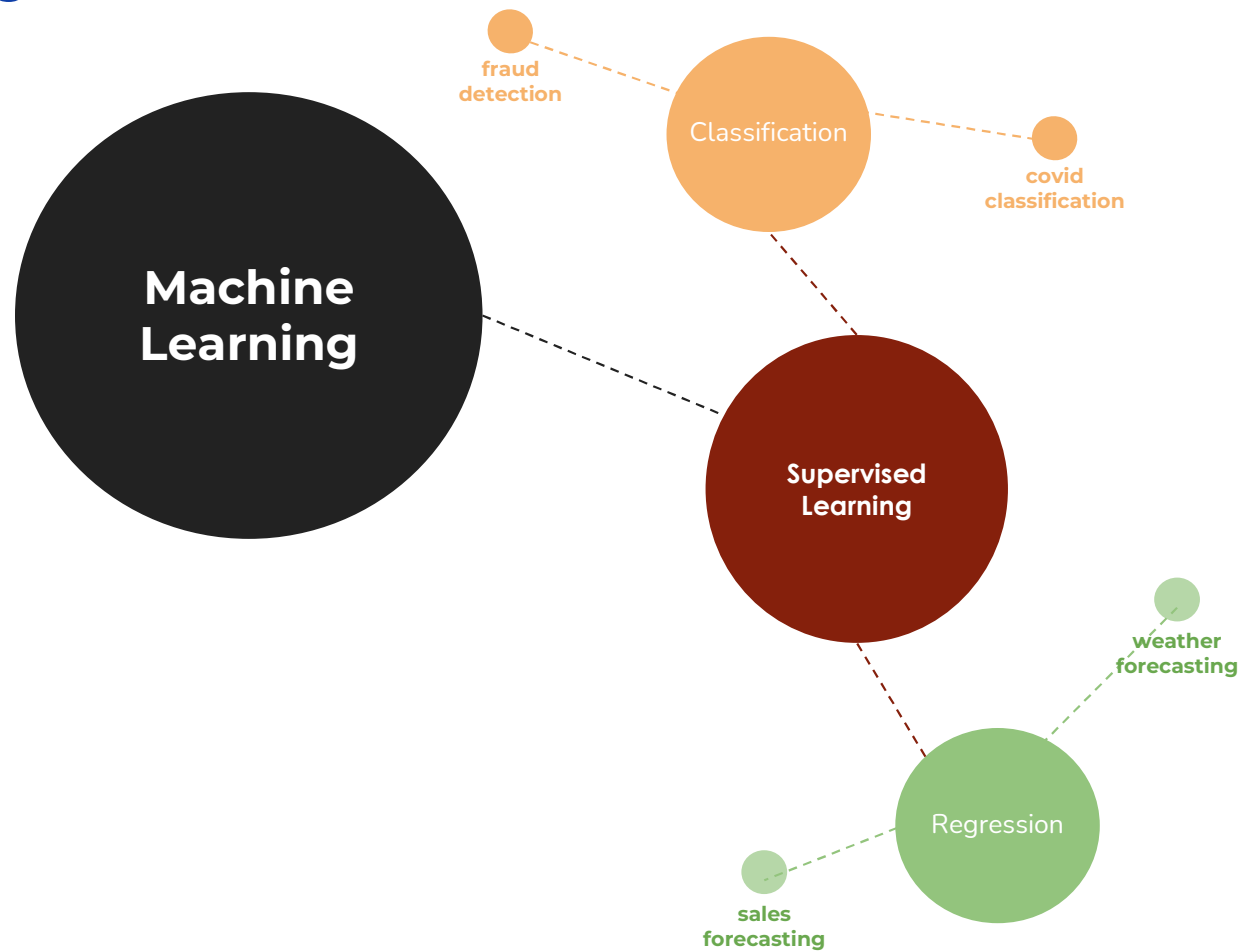
Training Data

What is Machine Learning (ML)?

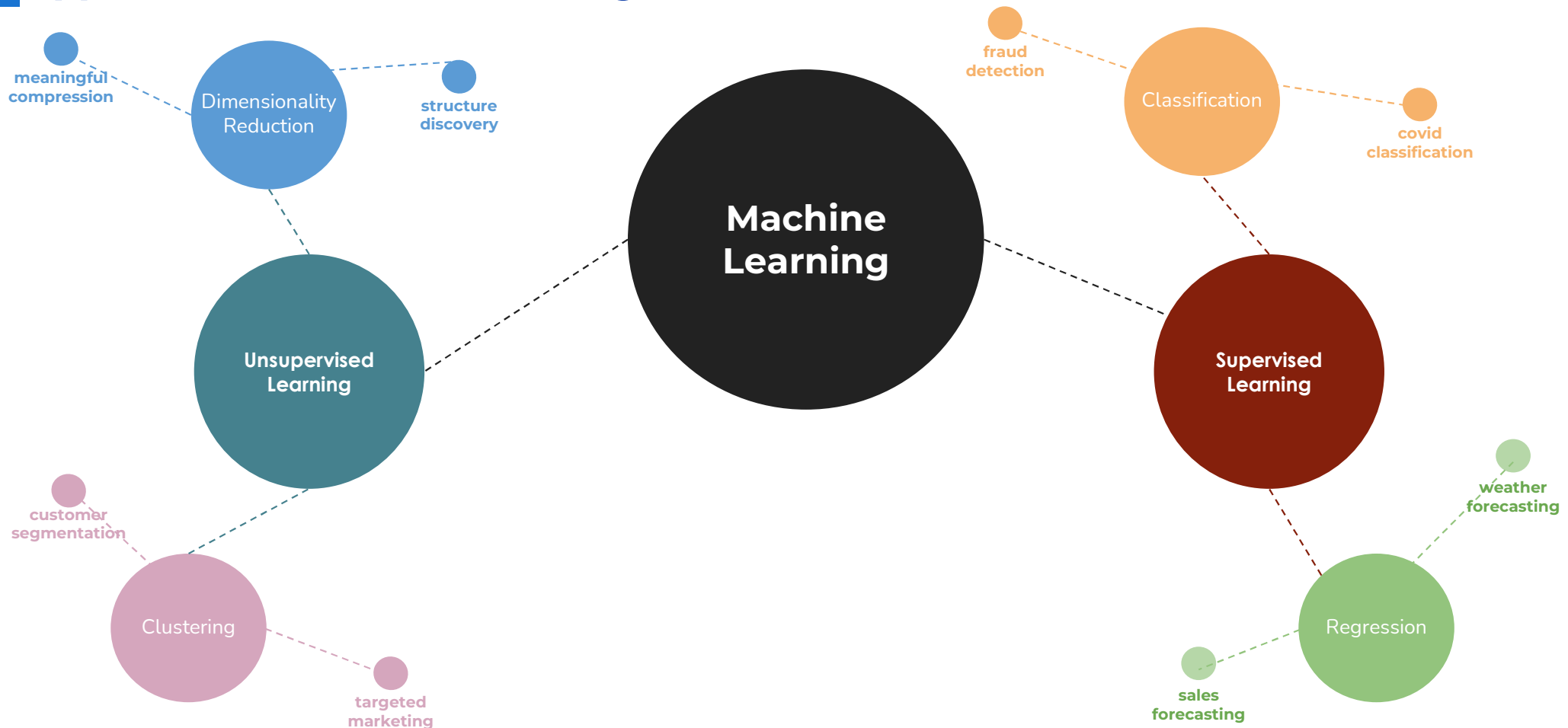
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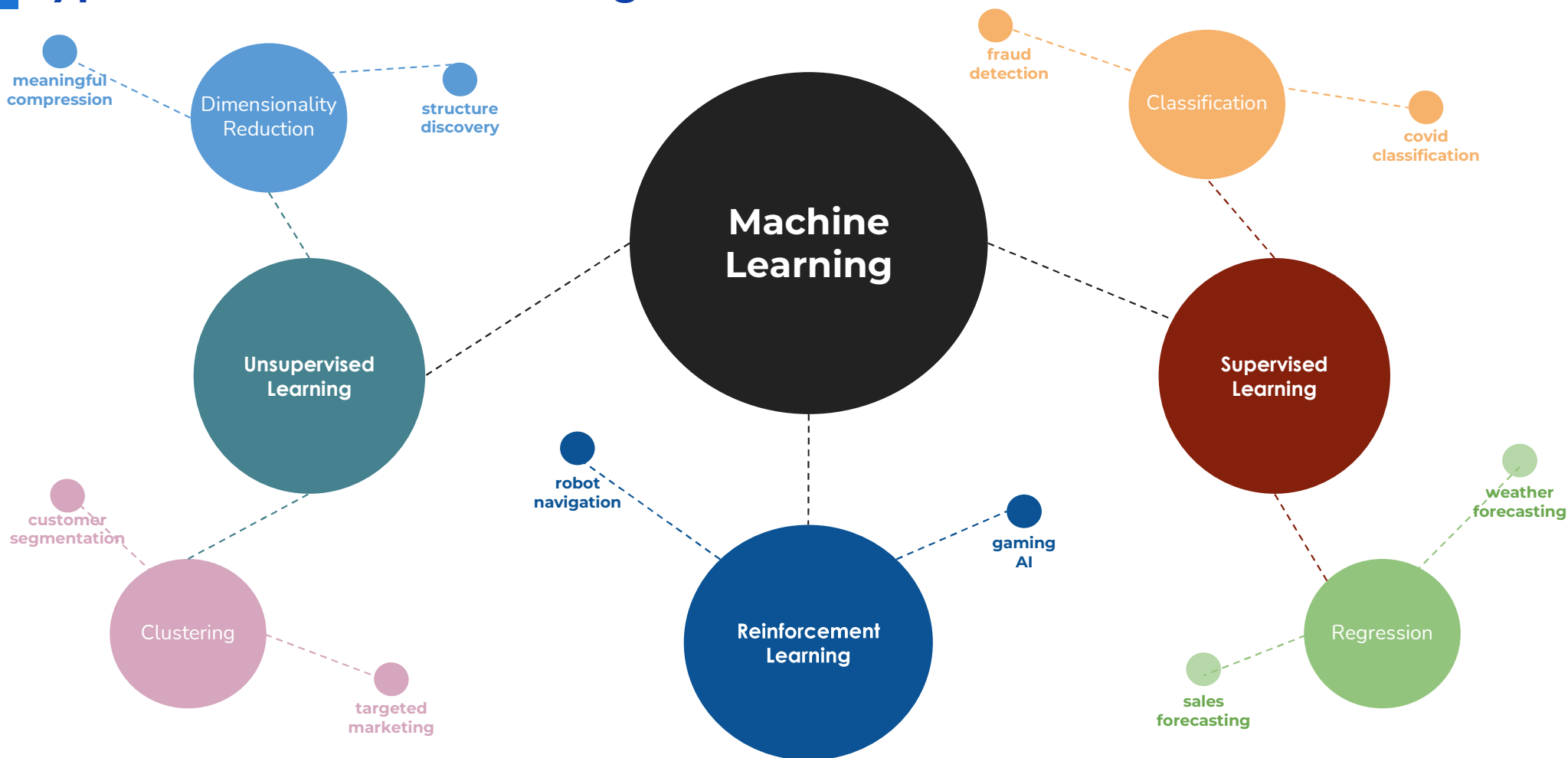
Types of Machine Learning



Types of Machine Learning



Types of Machine Learning



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.

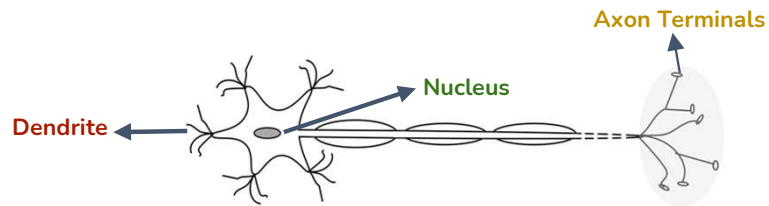
Predicting the price of a used car based on the attributes of the car

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

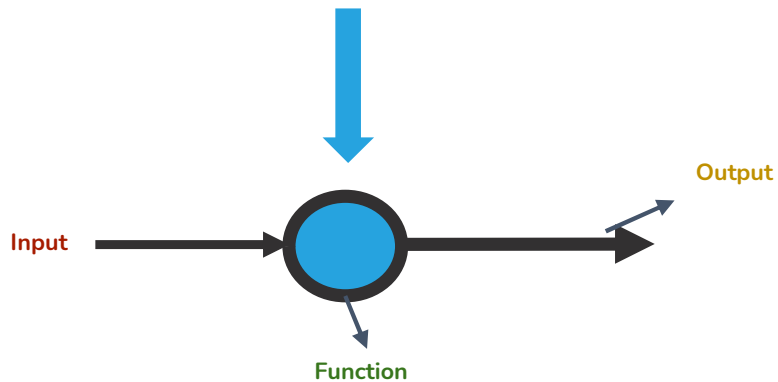
Predicting the likelihood of a hotel reservation getting cancelled

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

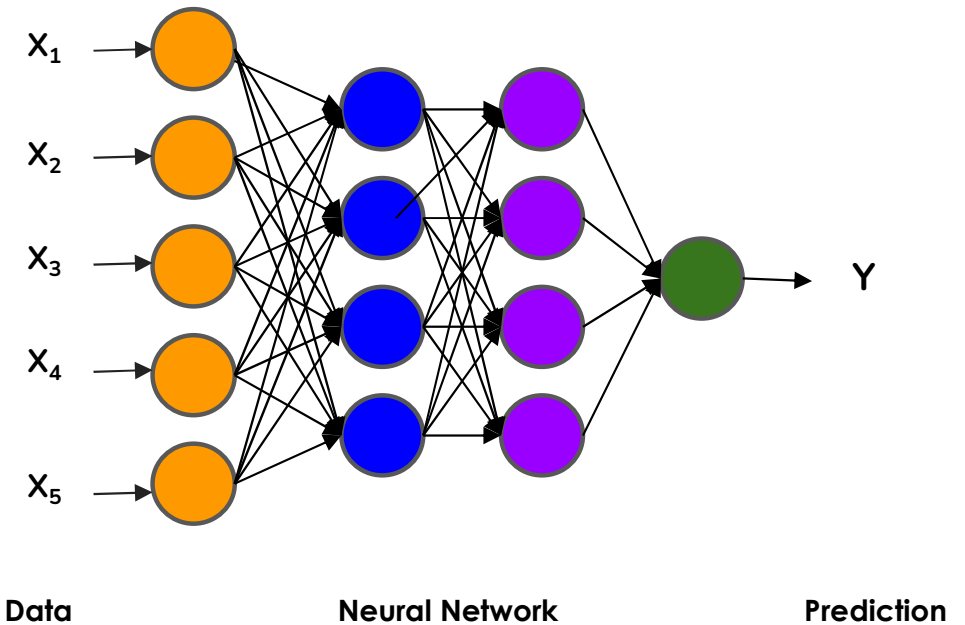
What is Deep Learning (DL)?



Biological Neuron



Artificial Neuron



Artificial Neural Network

Which of the following is a key characteristic of a neural network?

A

It uses a single-layer structure to process information

B

It mimics the structure of the human brain to process data

C

It depends entirely on simple, rule-based algorithms for making predictions

D

It is only used for data clustering

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Data Quiz

It uses a single-layer structure to process information

A neural network typically consists of multiple layers (input, hidden, and output layers) for processing information.

It mimics the structure of the human brain to process data

Neural networks are inspired by the structure and functioning of the human brain, using interconnected nodes (neurons) to process information.

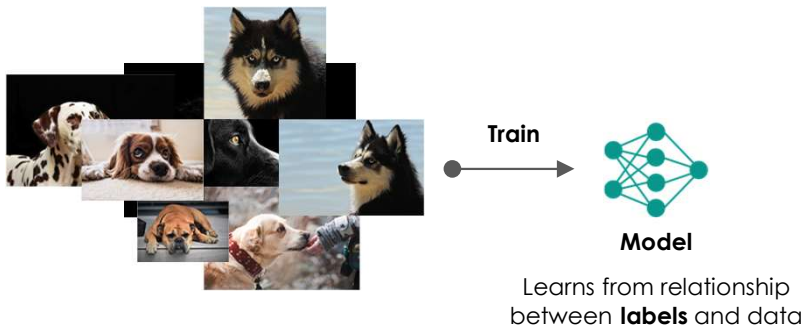
It depends entirely on simple, rule-based algorithms for making predictions

Neural networks use interconnected layers of neurons to process data and make complex predictions, rather than relying solely on simple, rule-based algorithms.

It is only used for data clustering

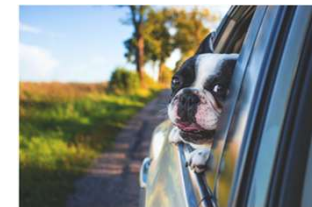
Neural networks are versatile and can be used for various tasks, including classification, regression, and clustering.

Types of AI



Could this be a dog?

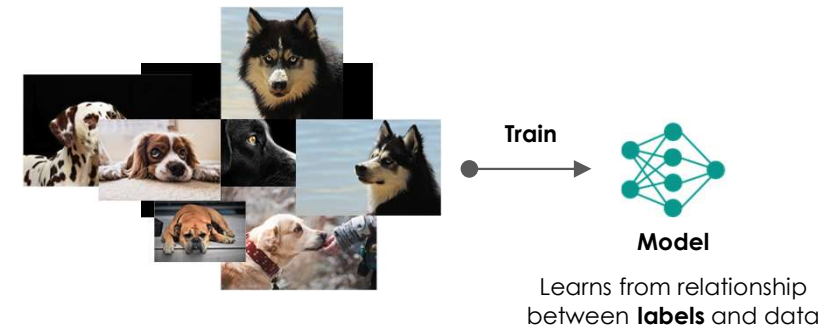
Classify



YES

Discriminative AI

Types of AI



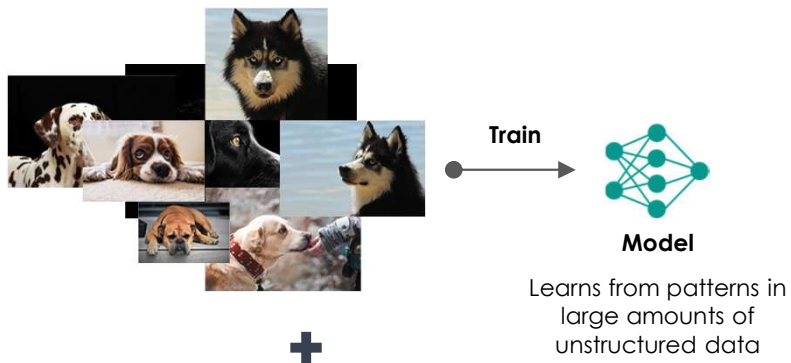
Could this be a dog?

Classify



YES

Discriminative AI



Other images on the internet

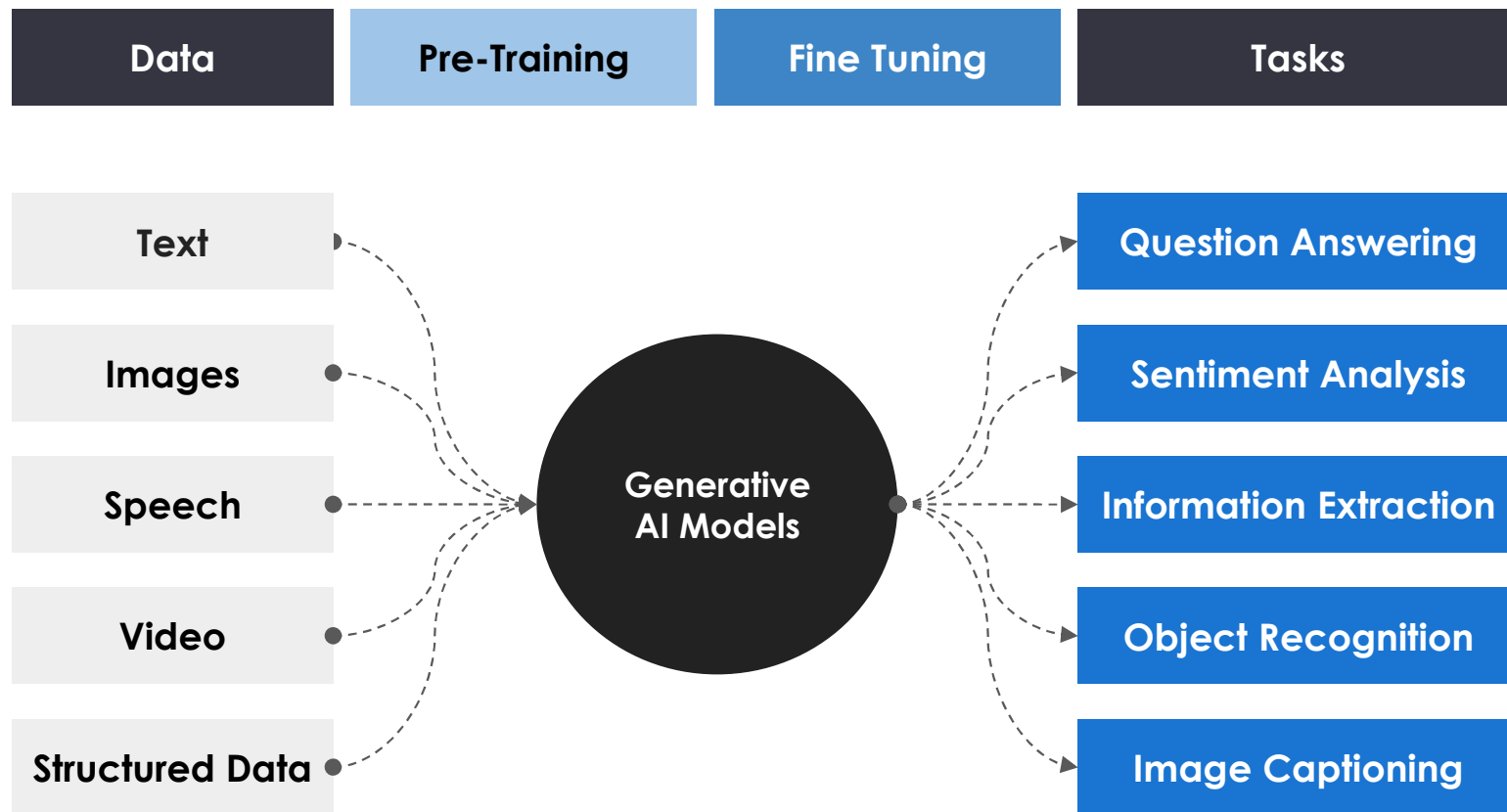
Create an image of dog, having fun in a party, wearing a black tuxedo with wine in one hand

Generate



Generative AI

A Peek into Generative AI Models



Large Language Models

Powerful AI models trained on massive amounts of data to learn the complex patterns and rules of human language, allowing them to perform a wide variety of tasks

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Language

Deals with text data (takes input in text and generates output in text)

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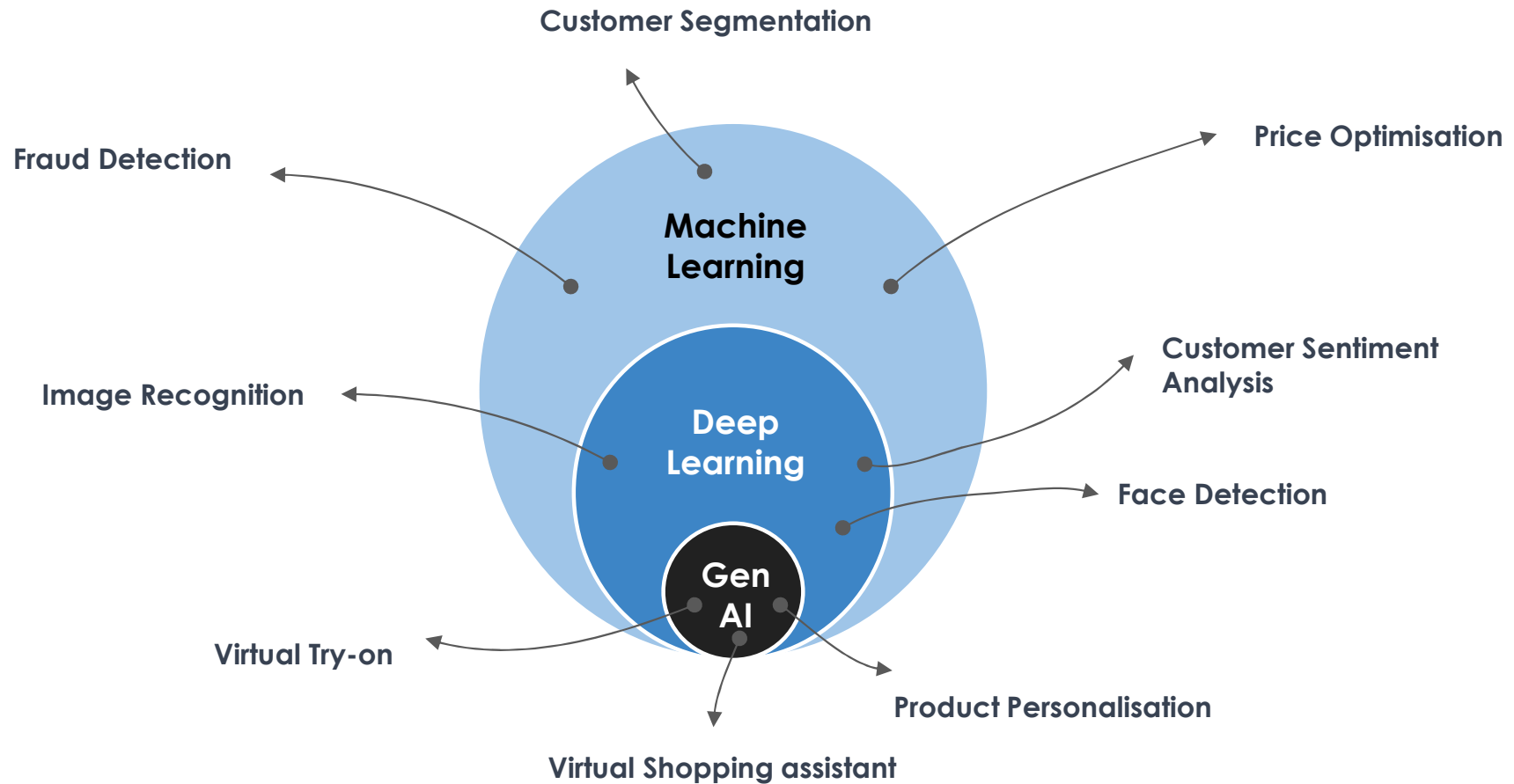
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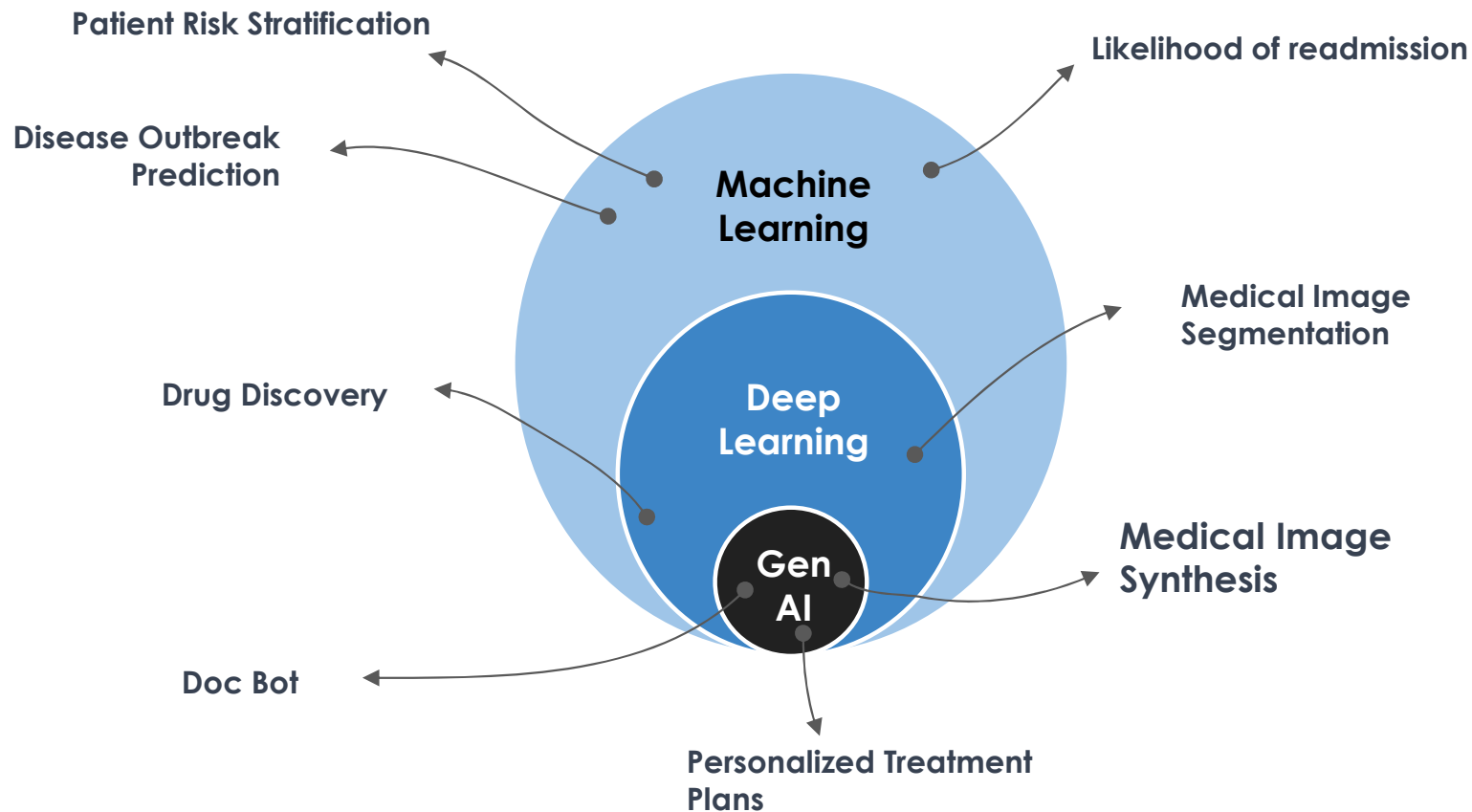
Model

Predicts the next token

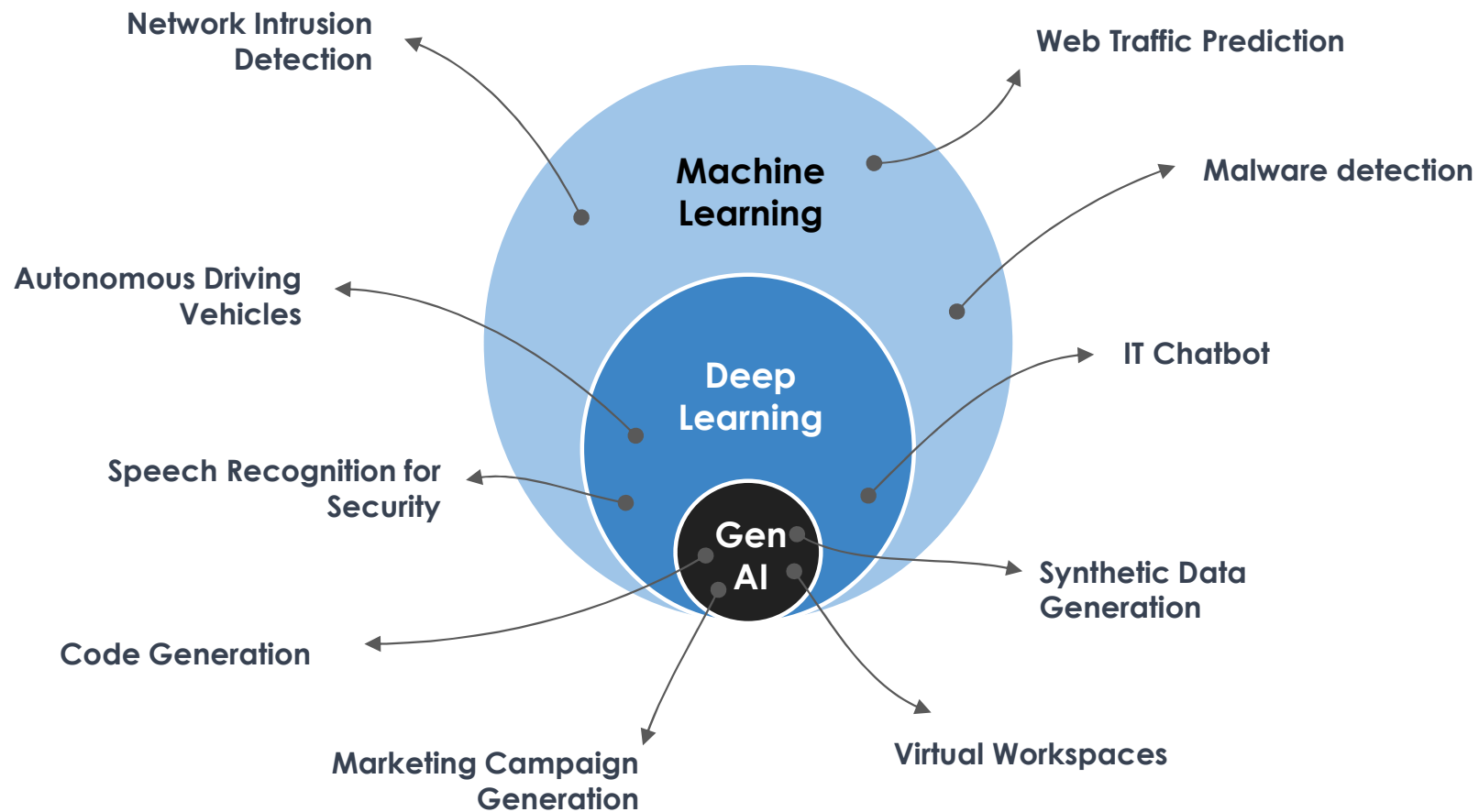
Business Problems Solved by Generative AI - Retail



Business Problems Solved by Generative AI - Health care



Business Problems Solved by Generative AI - Technology



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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

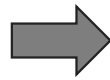
Generative AI models can transfer artistic styles between different image by identifying the underlying patterns. These style transfer abilities allow for the transformation of an image to adopt the artistic style of another image.

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

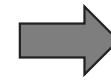
Problems like the prediction of likelihood of loan repayment default are effectively dealt with by discriminative AI algorithms. They are generally more robust in these type of tasks as they learn the decision boundaries directly.

Limitation of Large Language Models

I want to book a flight from Chennai to Delhi for a meeting on July 15th. I'm open to any time. What are the least expensive options available?

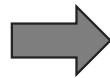


Large Language Model



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Large Language Model

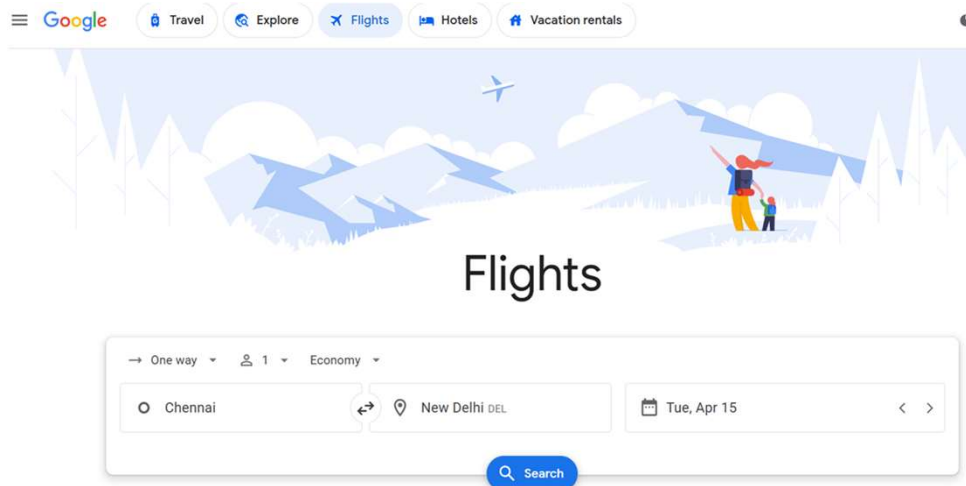


I don't have the ability to search for real-time flight information or book flights directly. However, I can suggest some tips on how to find the least expensive options for your flight from Chennai to Delhi on April 15th:

1. Flight comparison websites like Skyscanner or Google Flights allow you to compare prices from different airlines. Set your departure city (Chennai) and arrival city (Delhi) along with the date.
2. Then, from the available options, choose the flight with the lowest fare.

Limitation of Large Language Models

Searching Flights



Google Travel Explore Flights Hotels Vacation rentals

Flights

→ One way ▾ 1 ▾ Economy ▾

○ Chennai ↔ ○ New Delhi DEL

Tue, Apr 15 < >

Search

Finding Cheapest Flight

↔ Round trip ▾ 1 ▾ Economy ▾

○ Chennai ↔ ○ New Delhi



Tue, Apr 15 < > Sat, Apr 19 < >

All filters Stops ▾ Airlines ▾ Bags ▾ Price ▾ Times ▾ Emissions ▾ Connecting airports ▾ Duration ▾

Best ○ Cheapest from ₹10,900 ○

Top departing flights

Ranked based on price and convenience ⓘ Prices include required taxes + fees for 1 adult. Optional charges and bag fees may apply. Sorted by top flights ⬆

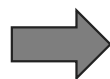
 7:30 PM – 10:25 PM IndiGo Avoids as much CO ₂ e as 1,035 trees absorb in a day ⓘ	2 hr 55 min MAA–DEL	Nonstop	117 kg CO ₂ e -13% emissions ⓘ	₹11,357 round trip
 11:00 PM – 2:00 AM ⁺¹ IndiGo	3 hr MAA–DEL	Nonstop	117 kg CO ₂ e -13% emissions ⓘ	₹11,777 round trip

- An LLM **CANNOT** open a browser and search for the cheapest flights - it **only takes text as input** and **produces text as output**
- But LLMs are **good at providing steps to search** for the cheapest flight

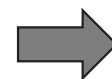
Introduction to Tools

In the case of LLMs, **tools** are external capabilities that the model can use to perform tasks beyond text generation, such as retrieving live information, running code, or analyzing documents.

List of flights from Chennai to Delhi
on July 15th



Google Search Tool

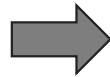


IndiGo | 6:05 AM - 11:25 AM | 5h
20m | 1 stop (HYD) | ₹12,268
IndiGo | 4:50 PM - 10:10 PM | 5h
20m | 1 stop (BLR) | ₹12,268
IndiGo | 8:55 AM - 2:40 PM | 5h
45m | 1 stop (BLR) | ₹12,268
IndiGo | 7:30 PM - 10:25 PM | 2h
55m | Nonstop | ₹11,357
IndiGo | 3:40 PM - 8:40 PM | 5h | 1
stop (HYD) | ₹12,268
IndiGo | 11:00 PM - 2:00 AM+1 | 3h
| Nonstop | ₹11,996

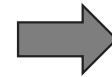
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Minimum Fare Tool

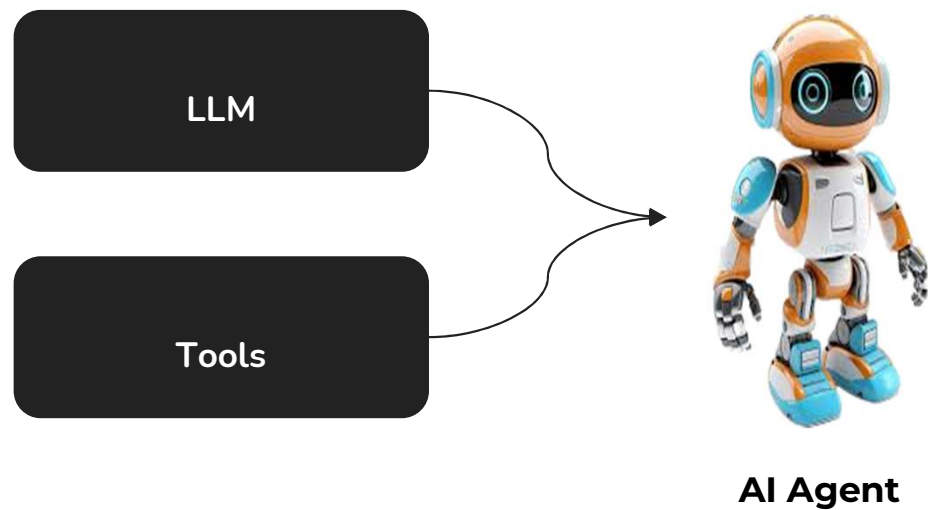


IndiGo | 7:30 PM - 10:25 PM | 2h 55m | Nonstop | ₹11,357

If an **LLM** has **access to these tools**, it can easily **answer our original question**.

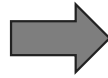
Introduction to Agent

An **AI agent** is a system that combines an LLM with tools while managing both the selection and use of the right tools to achieve the best results in answering a query.



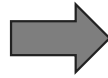
Agent in Action!

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First, let me use the Google Search tool to get the flight details

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Google Search
Tool

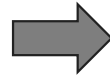
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Great! I got the flight details along with the fares and other information. To find the cheapest flight, I can use the Minimum Fare Tool

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Agent in Action!

I want to book a flight from Chennai to Delhi for a meeting on April 15th. I'm open to any time. What are the least expensive options available?



Great! Now I've also found the cheapest flight. Let me send the final result to the LLM to get the final output.

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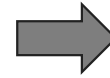
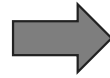
The least expensive flight from Chennai to Delhi on April 15 is with IndiGo: 7:30 PM - 10:25 PM, 2h 55m, Nonstop, priced at ₹11,357.

LLM

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Agent in Action!



Stopping the process now!

Interacting with Generative AI Models



Hands-on: Exploring Generative AI Tools



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