Introduction to Deep Learning

Video 1: Exploring Deep Learning

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In Air

Introduction

Tesla’s self driven cars

ChatGPT

Amazon delivery via drones

DEEP LEARNING !

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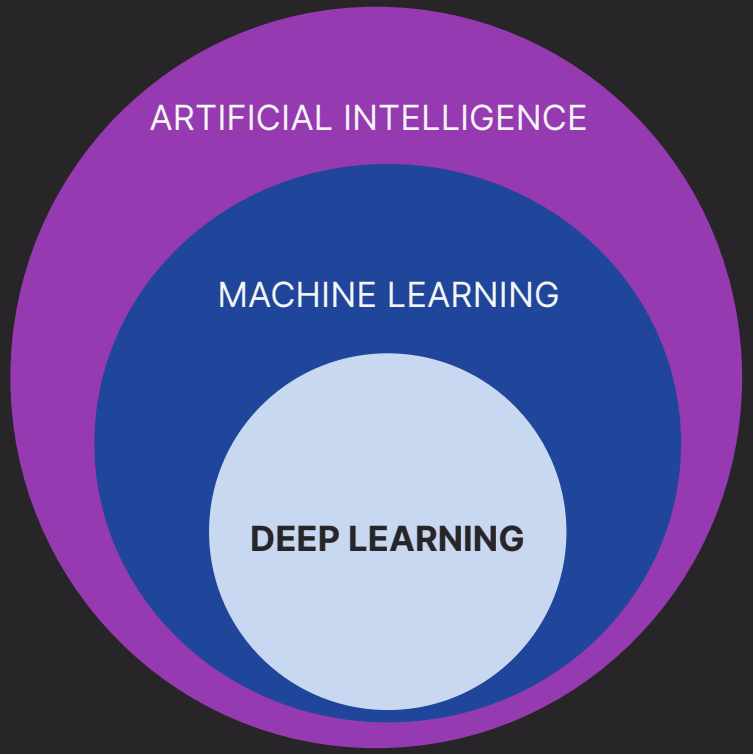
Deep Learning



- **Deep Learning** is a sub-field of Machine Learning
- Both Machine Learning and Deep Learning learn from data
- Uses **Neural Networks** and large volumes of data

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Deep Learning

DL performs better on unstructured data (texts, images, videos, etc)

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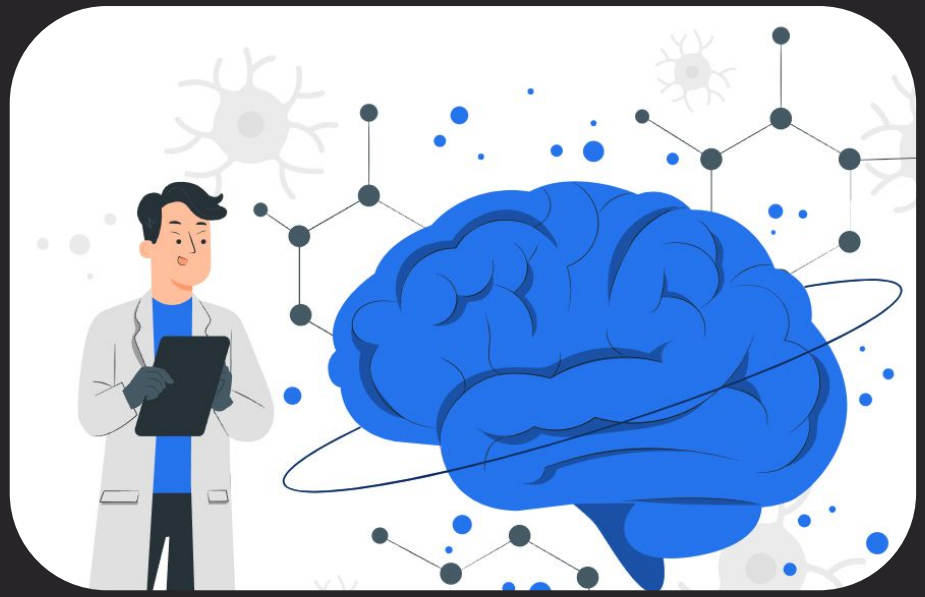
Deep Learning



Deep Learning uses complex algorithms inspired by the human brain's function.

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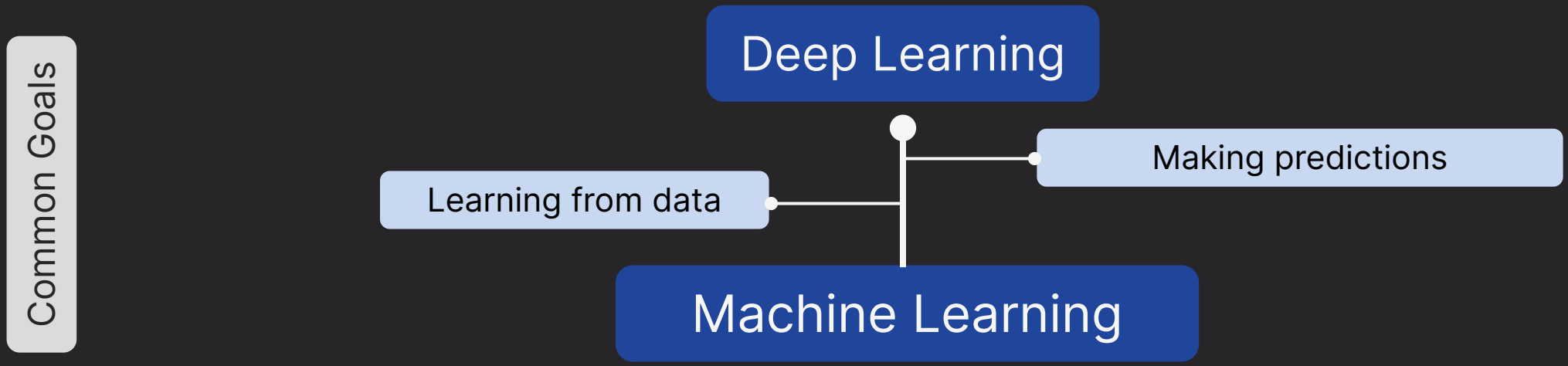
Machine Learning and Deep Learning



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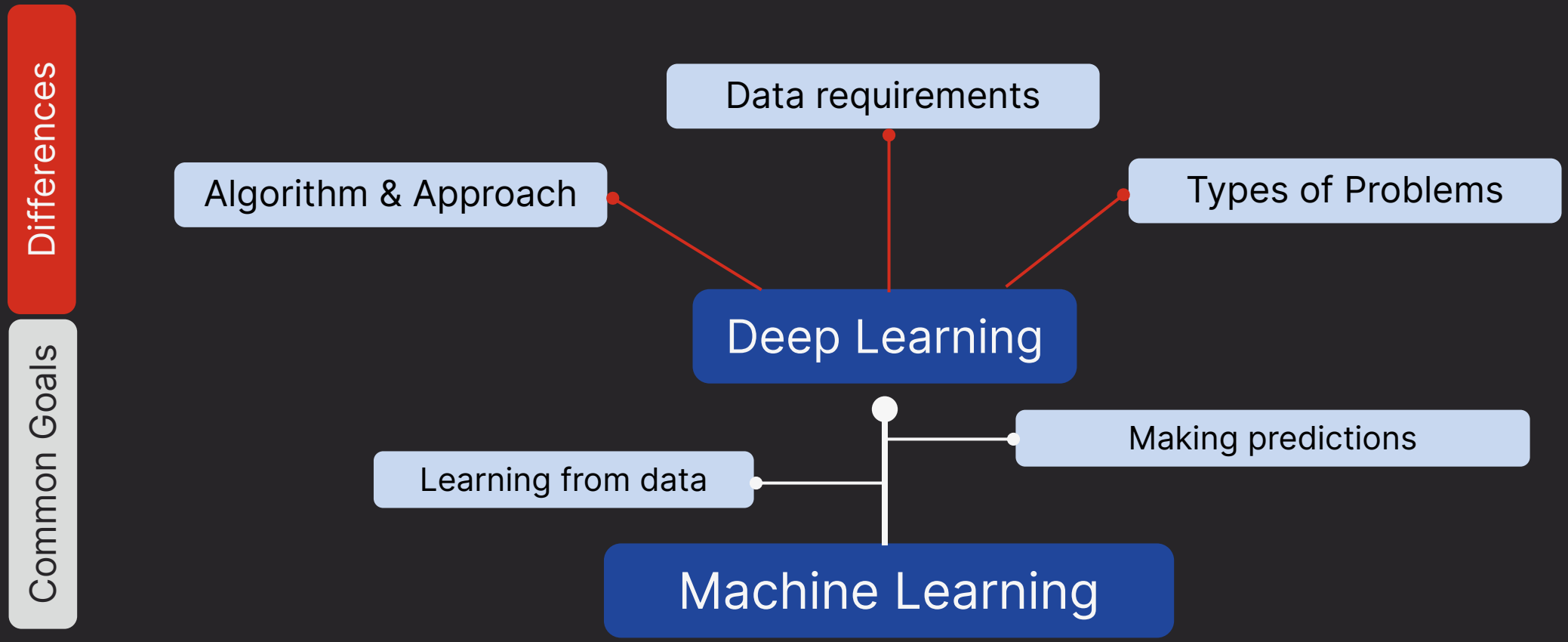
Machine Learning and Deep Learning



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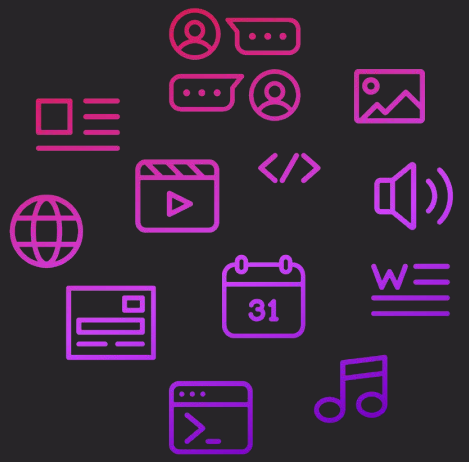
1. Based on Problem Solving Approach

Machine Learning

	A	B	C	D	E	F
1	Page_traffic	Unit_price	**Units_sold**	Segment	1_Star_Ra	2_Star_Ra
2	5835	22.21438918	**2071**	Skincare	99	72
3	1881	11.87077827	**681**	Skincare	118	73
4	2477	27.64571429	**875**	Makeup	108	85
5	4087	16.89684814	**1396**	Makeup	82	64
6	1446	16.35766423	**822**	Hair Care	29	24
7	2875	19.55812036	**1213**	Skincare	62	55
8	4688	22.30575256	**1269**	Makeup	0	0
9	3947	14.01656805	**845**	Makeup	43	29
10	5503	23.75960867	**1431**	Skincare	35	33
11	4131	27.84563758	**1043**	Skincare	0	0
12	1935	21.13953488	**817**	Makeup	91	69

Good for problems with **structured data** and **simpler tasks**

Deep Learning



Good for handling **unstructured data** and **complex tasks**

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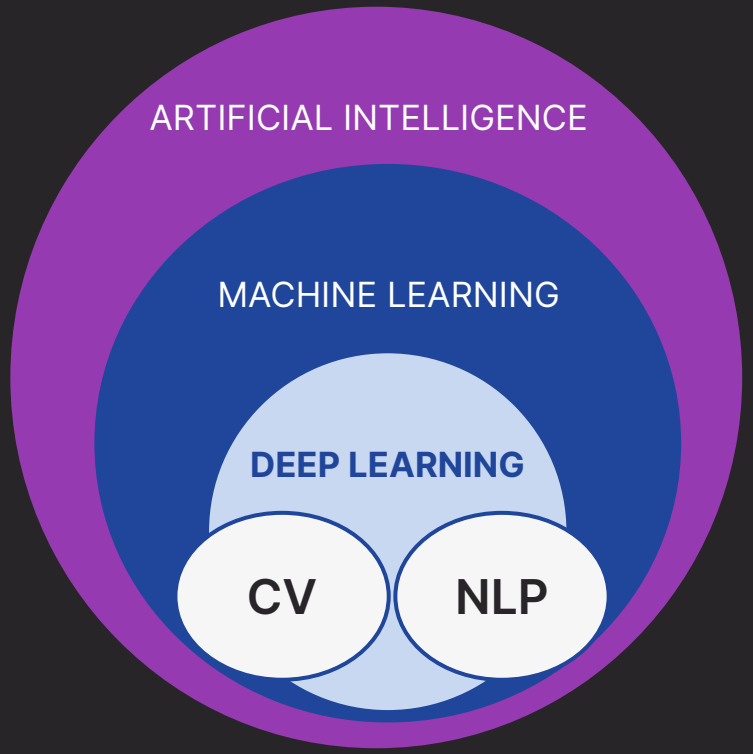
1. Based on Problem Solving Approach



Computer Vision: Deals with extracting information from **images and videos**.

NLP: Field of study that extracts information from **text**.

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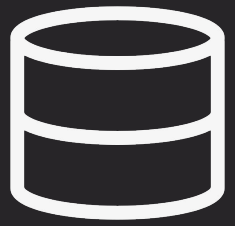
2. Based on Data Requirements

Machine Learning



Requires data to learn and perform **simple tasks**

Deep Learning

Requires **large data** to learn, train and perform **complex tasks**

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3. Based on Hardware Dependencies

Machine Learning

Can run on **personal computers** with CPUs and **smaller servers**

Deep Learning

Requires more **computational power** and **high end GPUs and TPUs** for efficient training

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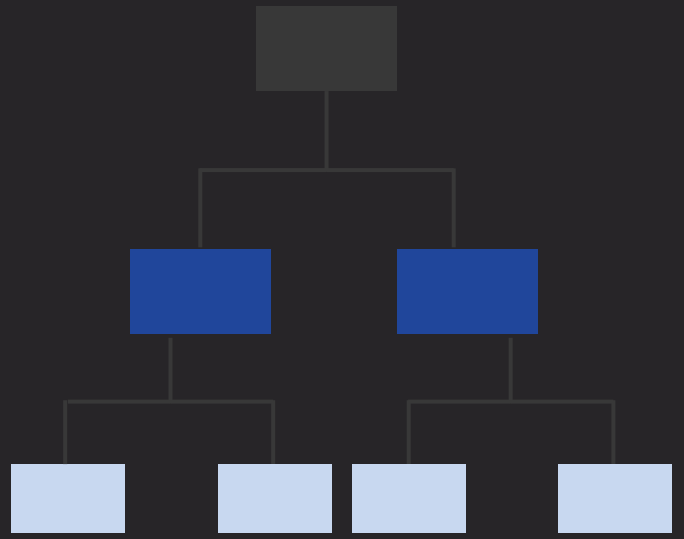
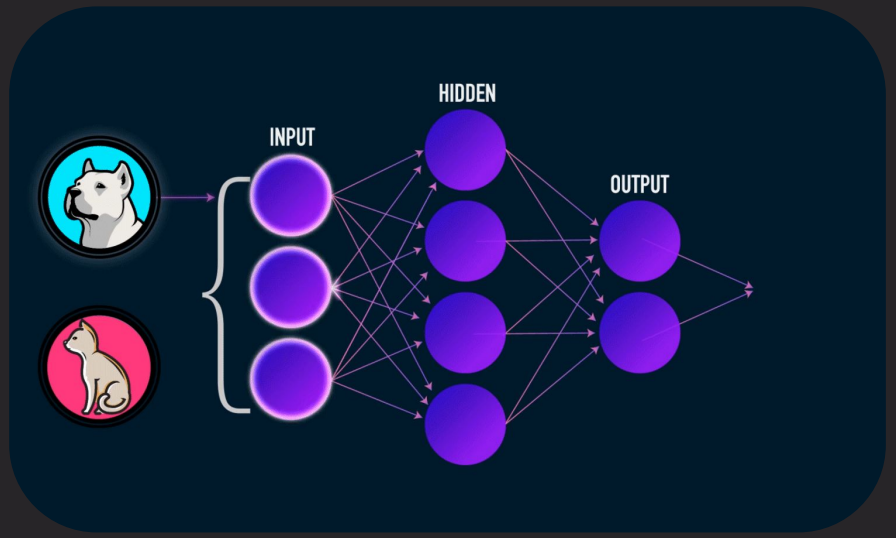
4. Based on Complexity & Interpretability

Machine Learning



Less complex and easily interpretable models

Deep Learning



Complex models with multiple layers; less interpretable

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5. Based on Training Time

Machine Learning

Models require less training time

Deep Learning

Models take longer training time due to volume of data

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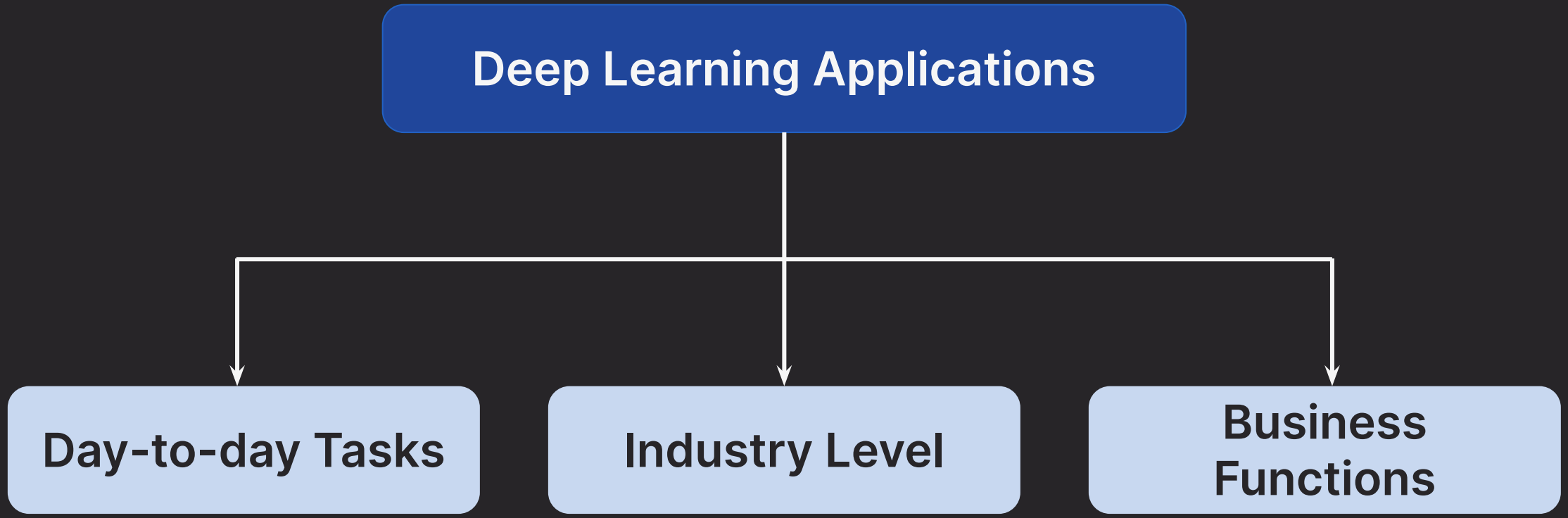
Applications of Deep Learning



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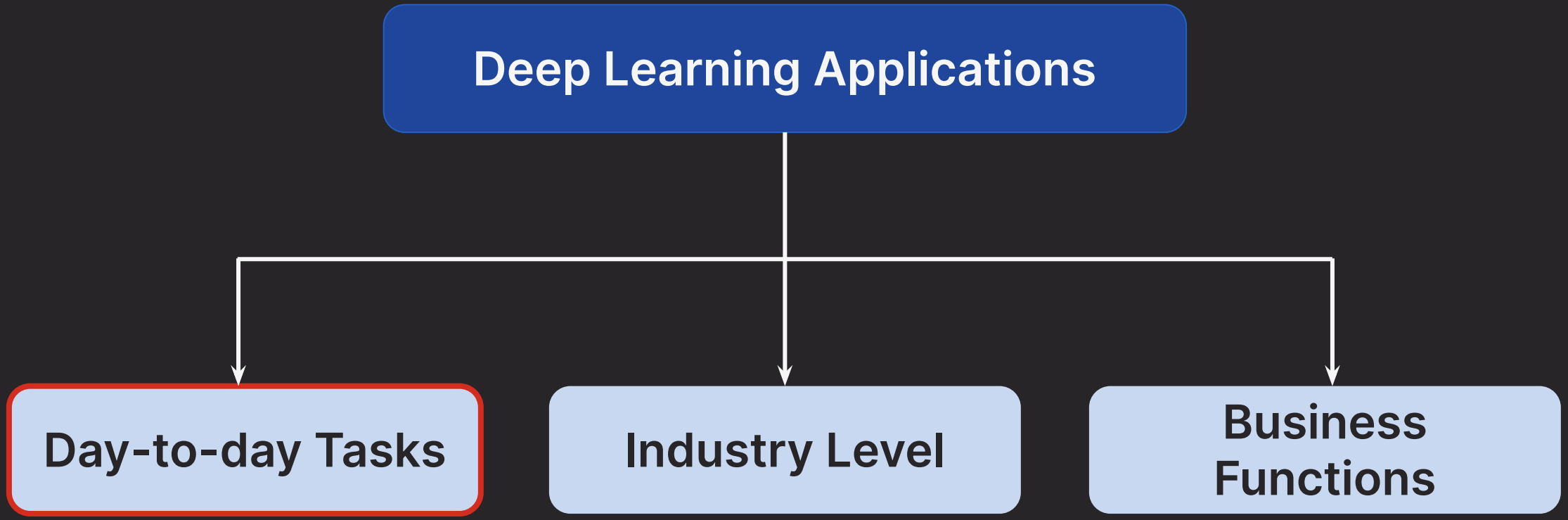
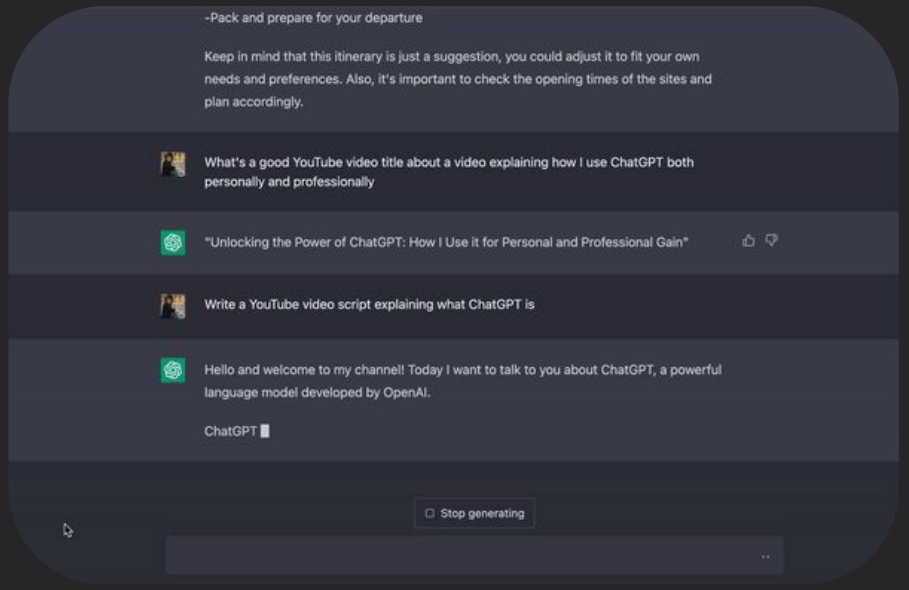
Applications of Deep Learning



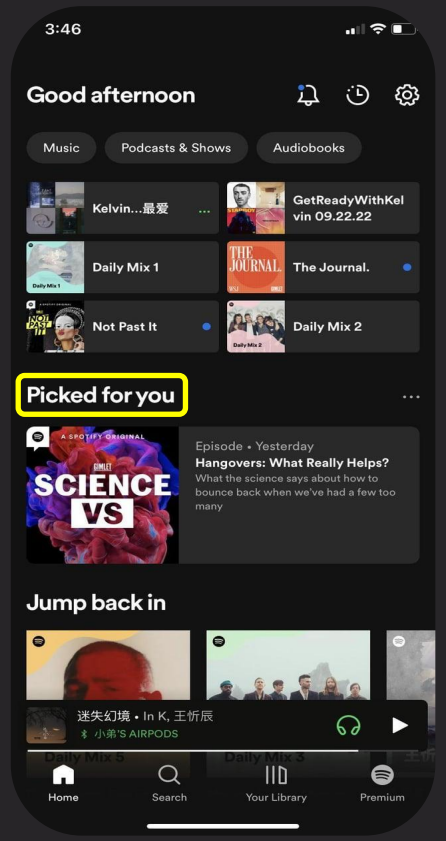
Language Interpretation

Google Assistant

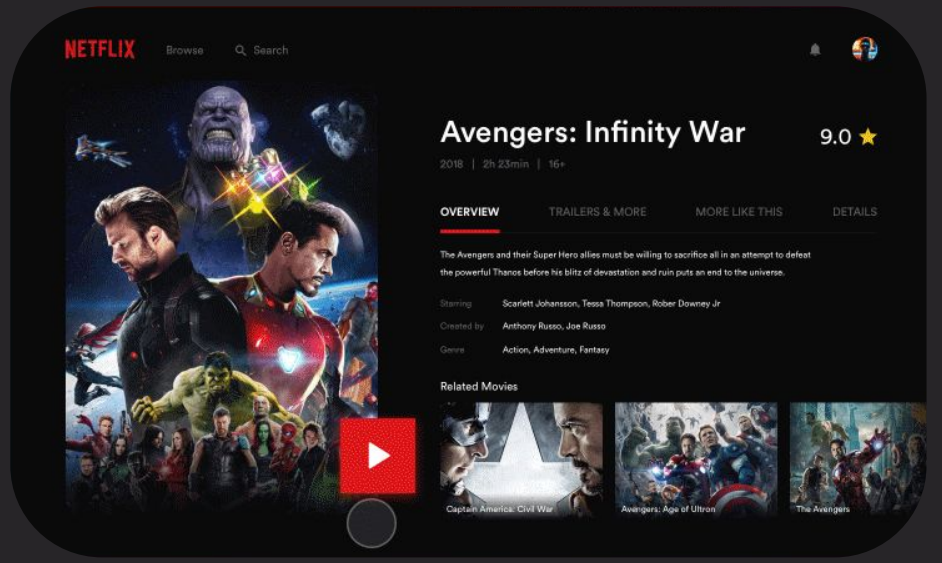


ChatGPT

Recommendation Systems



Spotify



Netflix

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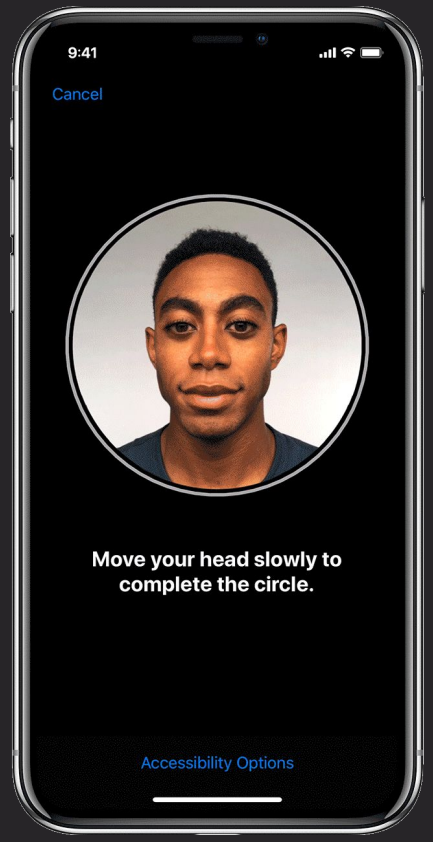
Image Recognition and Computer Vision



Smartphone FaceID Recognition

Tesla's Autopilot

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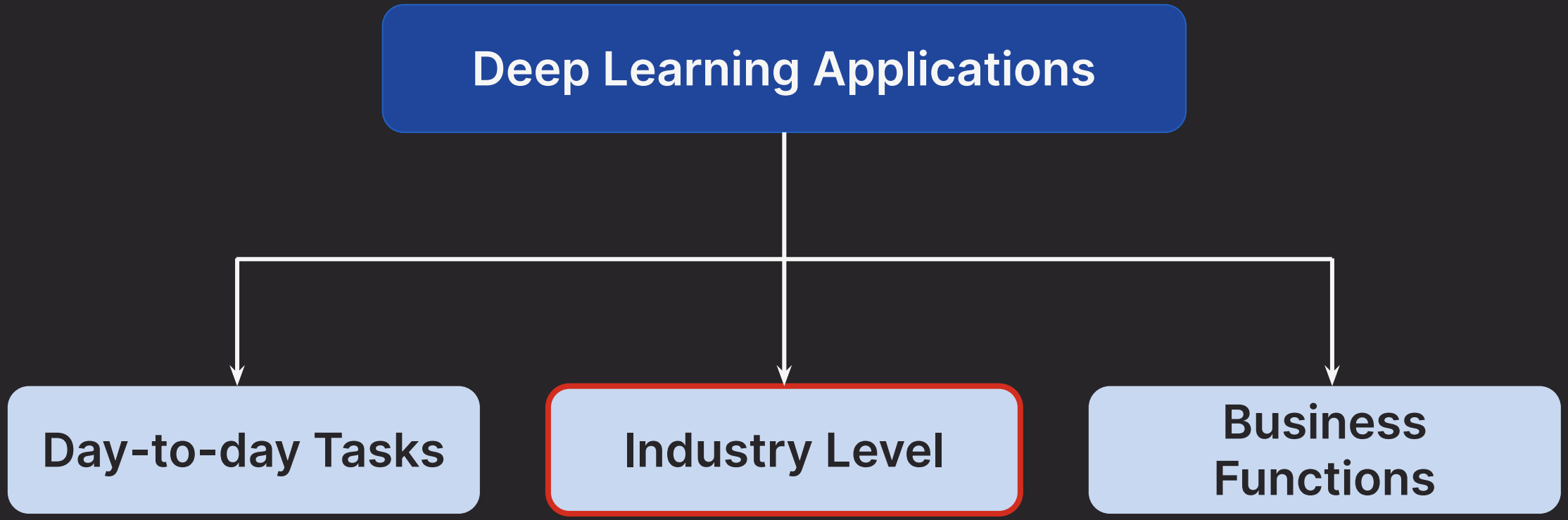
Applications of Deep Learning



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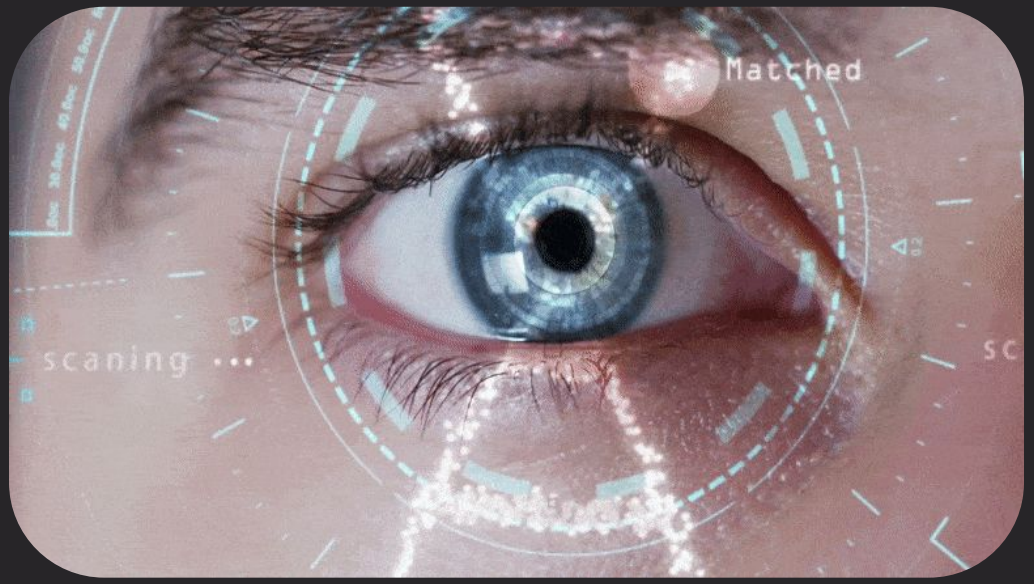
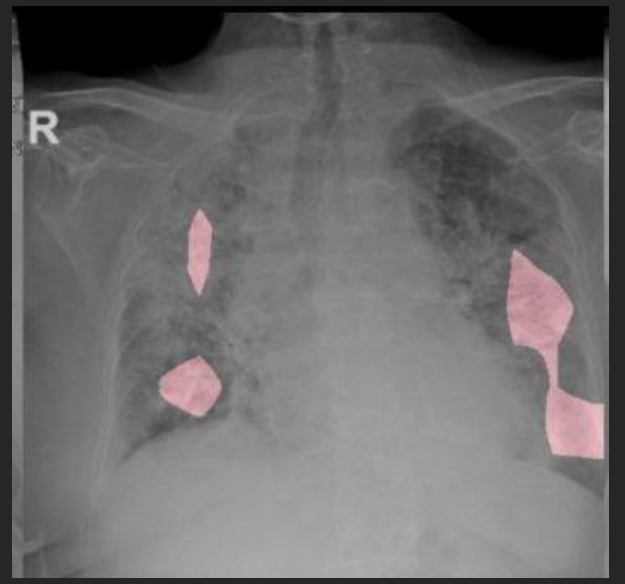
Healthcare



Diabetic Retinopathy Detection



Medical Imaging Analysis

Financial Companies

Mastercard Decision Intelligence: Analyze transactions to detect fraud

Retail and E-Commerce

Flytrex

Amazon go

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Media

Deoldify: Colorizes old images and films

Deep-fake: Alter or generate video content

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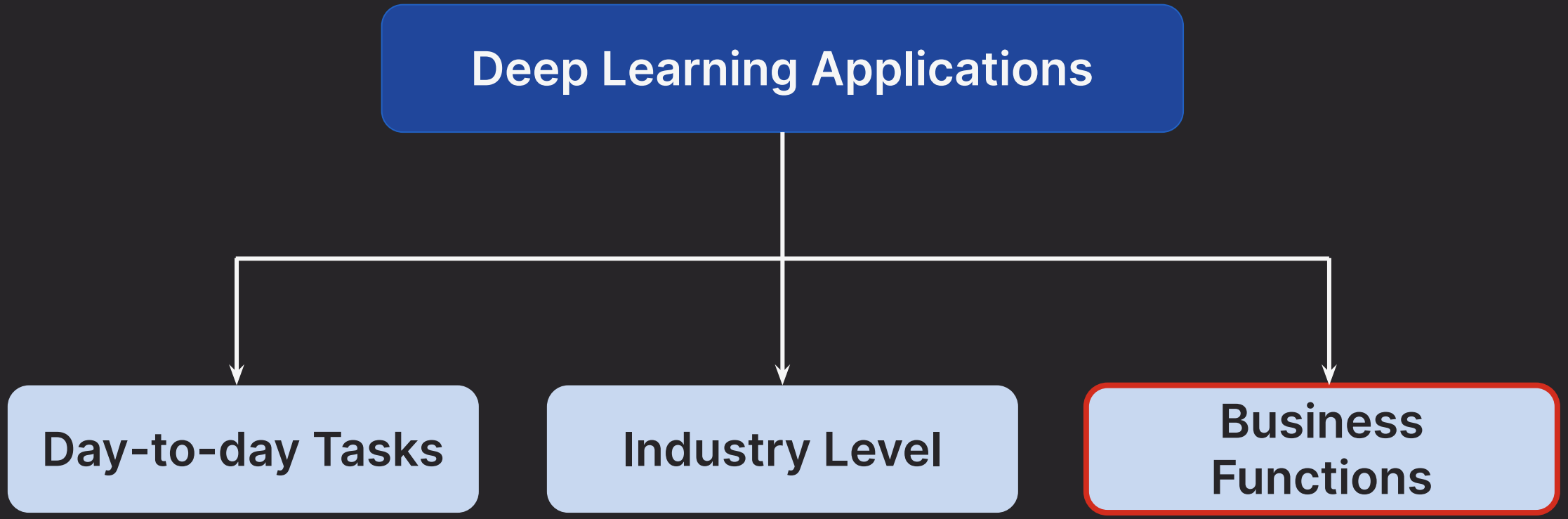
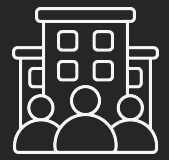
Applications of Deep Learning



Finance



Process automation in Corporate finance

Security analysis & Portfolio Management

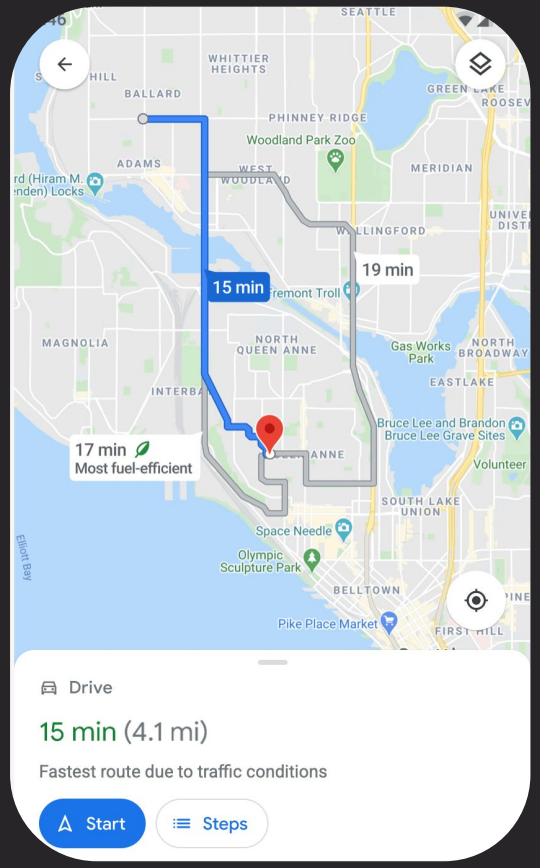
Asset Valuation & Management

Risk Management & Prevention

Operations

Coca-Cola Stock optimization using AI driven vending machines

Operations



Route Optimization in real-time

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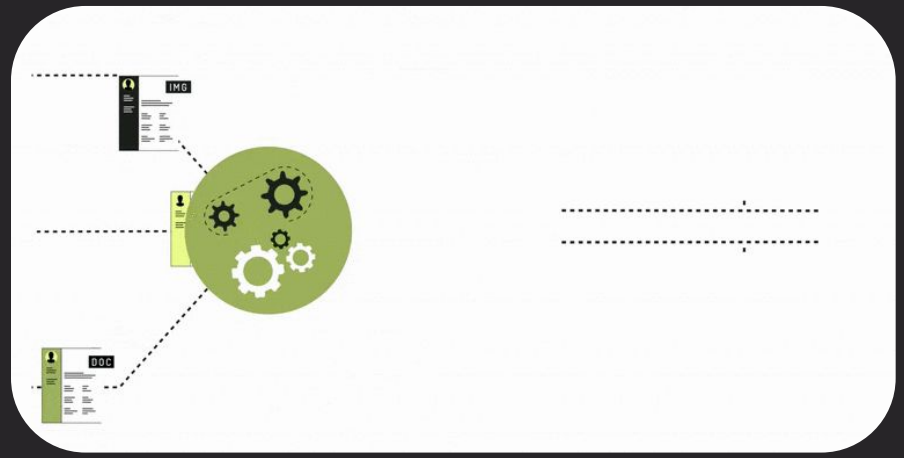
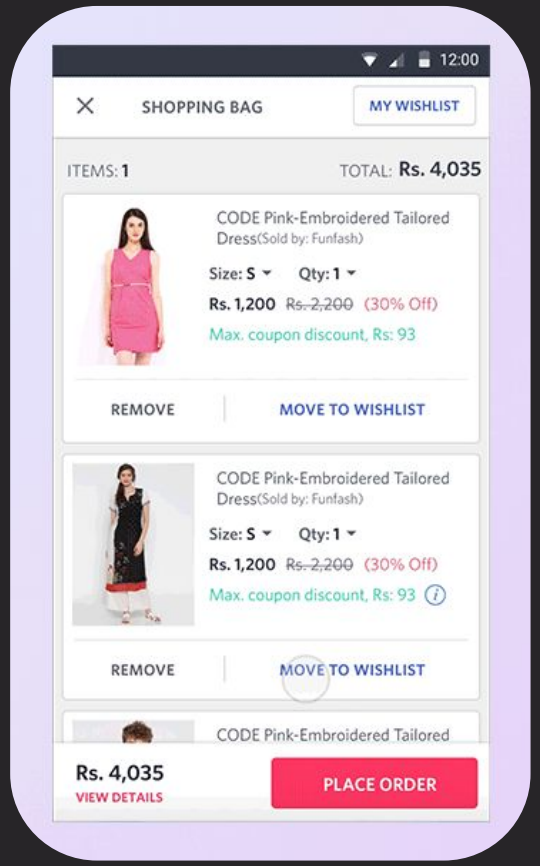
Human Resources



Talent Acquisition and Retention

Employee Sentiment Analysis

Marketing



Personalized Customer Experience

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In Air