Artificial Intelligence

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Agenda

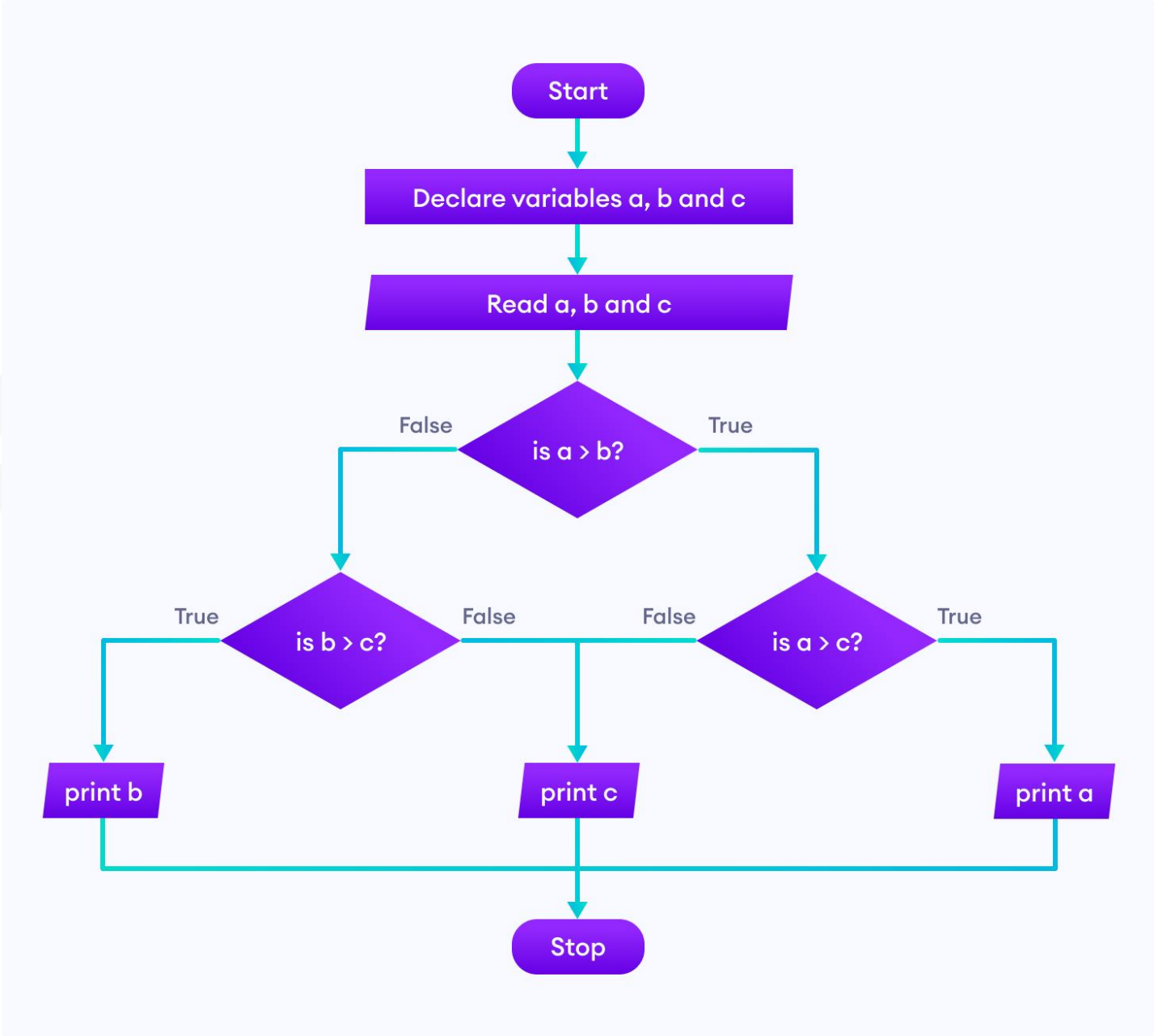
1. Introduction to Artificial Intelligence
2. Machine Learning
3. Computer Vision
4. Natural Language Processing

Traditional Programming

Which number is

BIGGER?

9 7


Start
Declare variables a, b and c
Read a, b and c
is a > b?
False
True
is b > c?
True
False
is a > c?
False
True
print b
print c
print a
Stop

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Can we count the stars?

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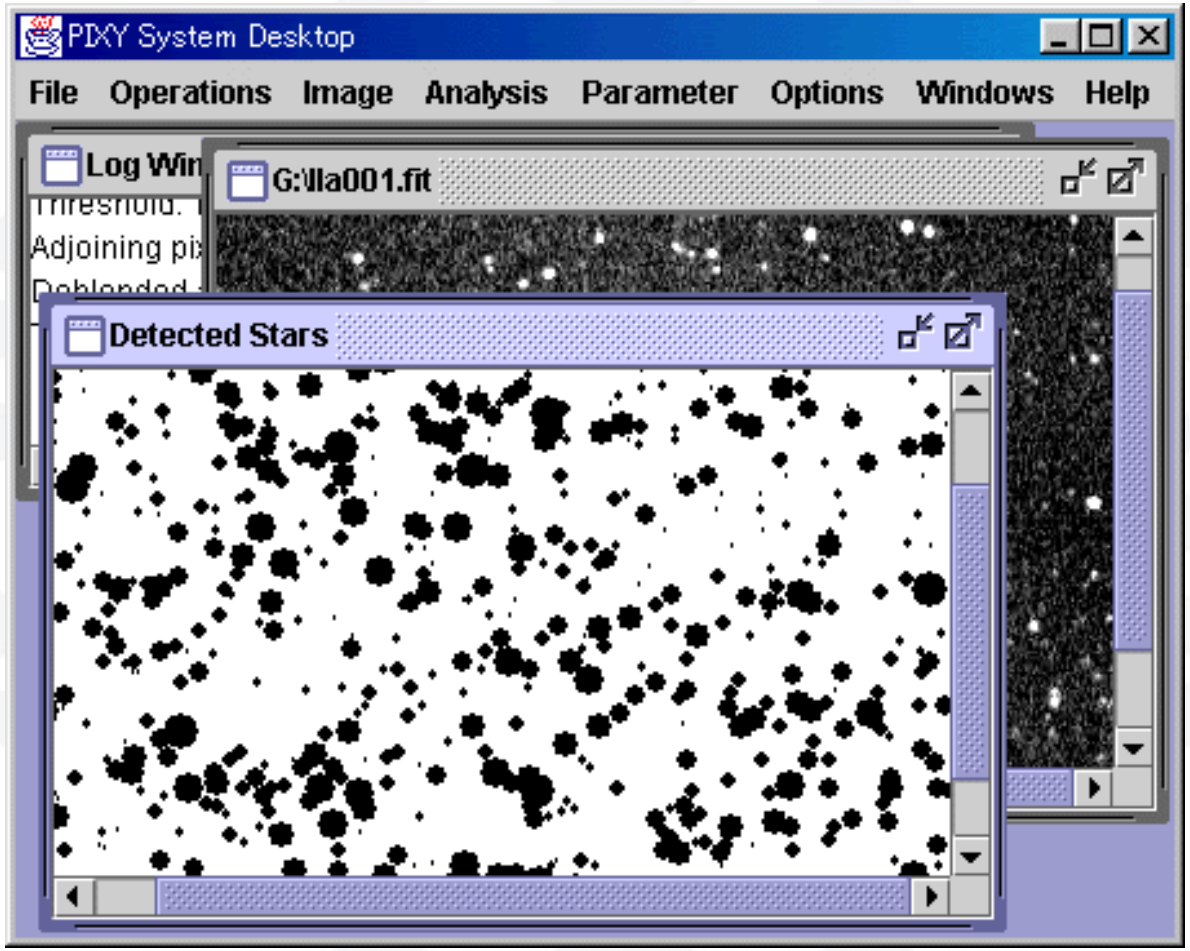
PIXY System Desktop
File
Operations
Image
Analysis
Parameter
Options
Windows
Help
Log Win
Adjoining pi
G:\la001.fit
Detected Stars

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Now how can we solve this?

Cat

Dog

Cat

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Artificial Intelligence

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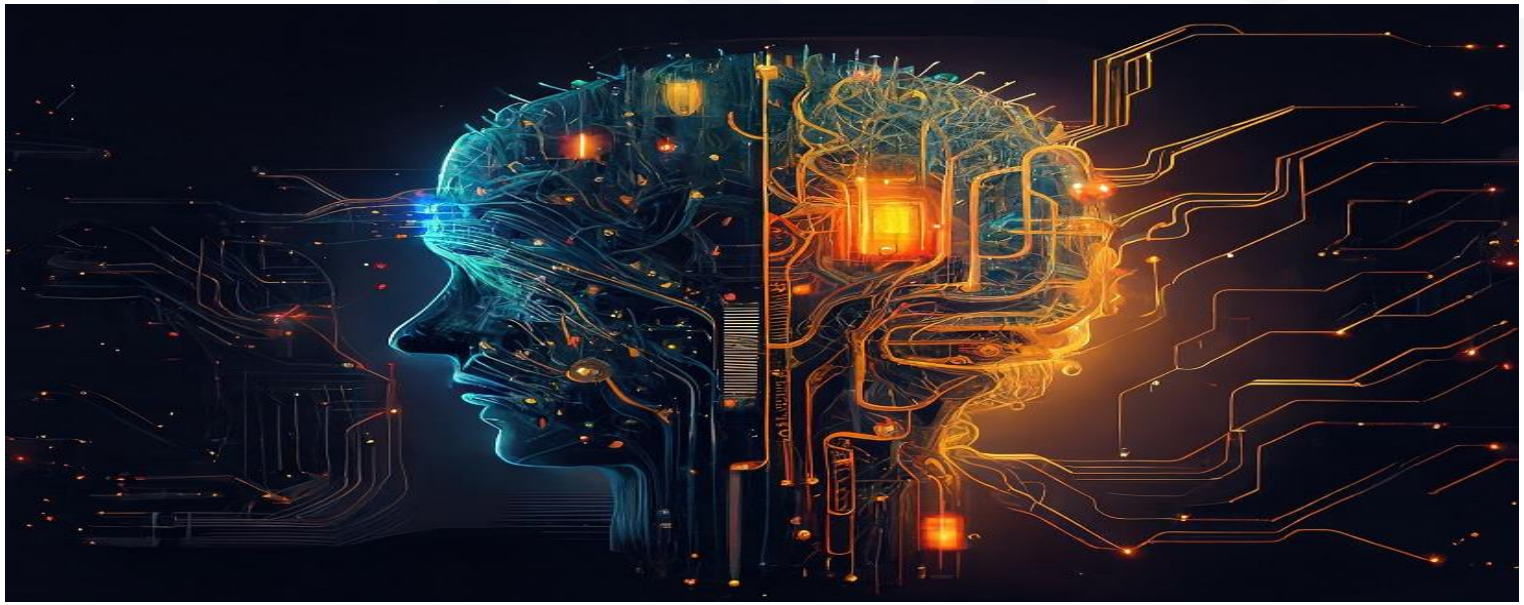
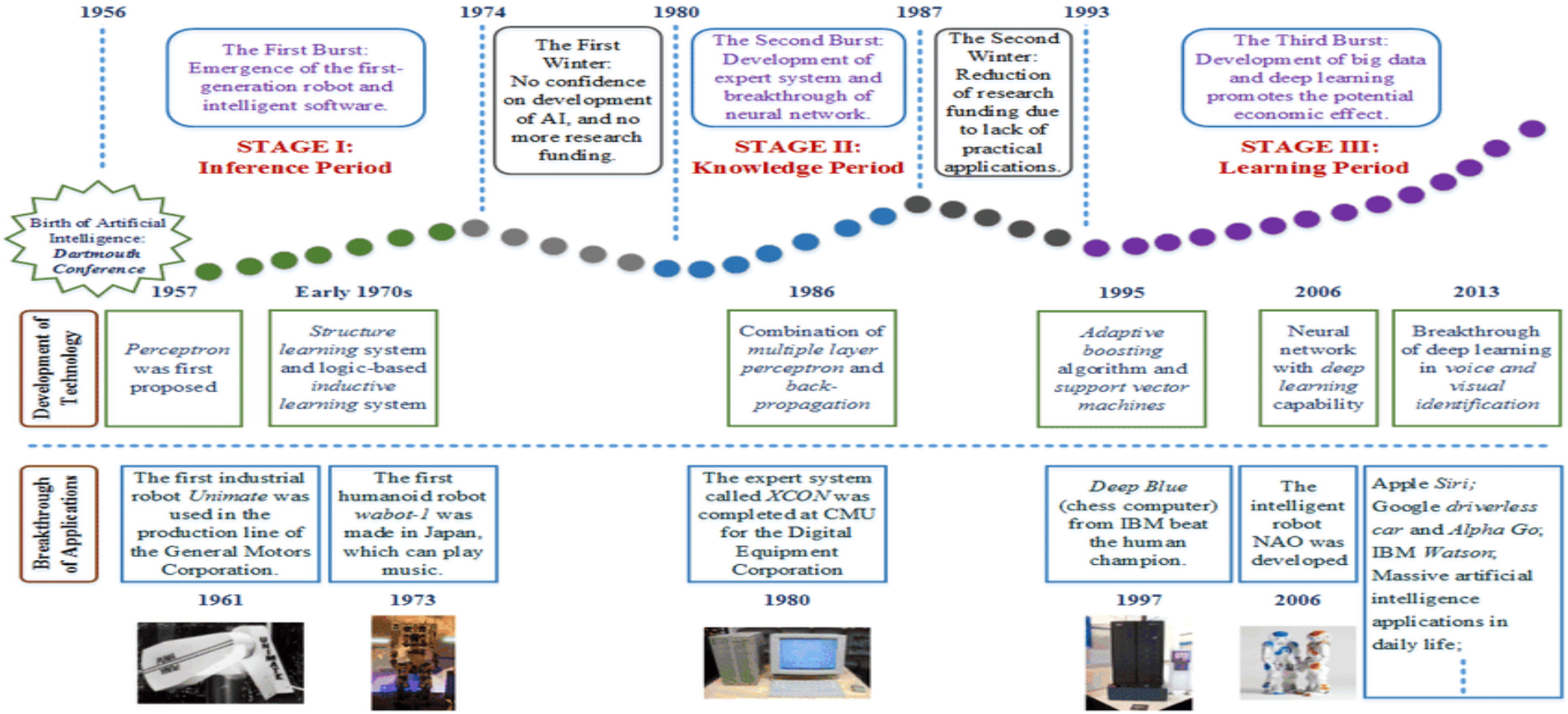
Artificial Intelligence

- **Artificial Intelligence (AI)** refers to the simulation of human intelligence in machines or computer systems that are programmed to perform tasks that typically require human intelligence. AI involves creating algorithms and systems that can learn, reason, perceive, and solve problems in a manner similar to humans.



History of Artificial Intelligence



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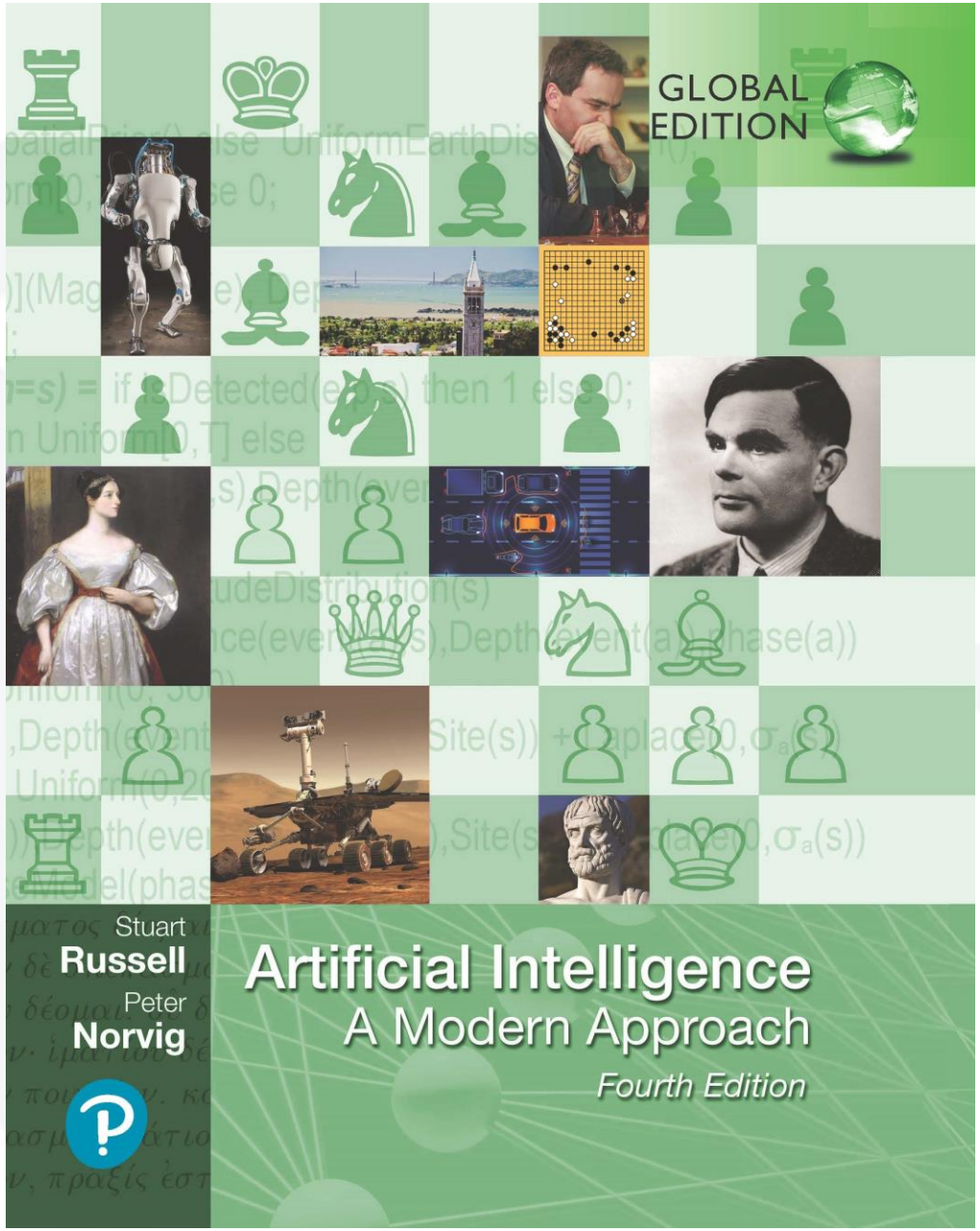
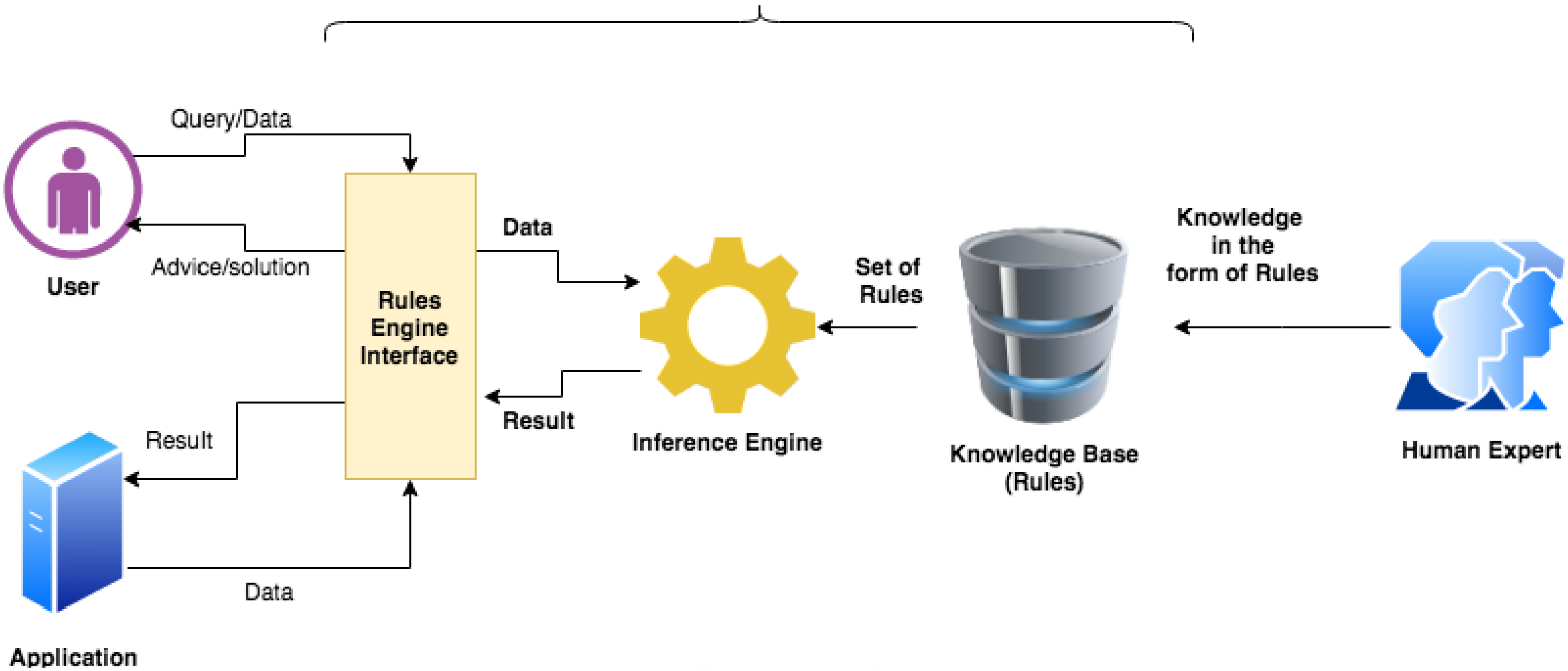
Recommended book →



Rules Based System



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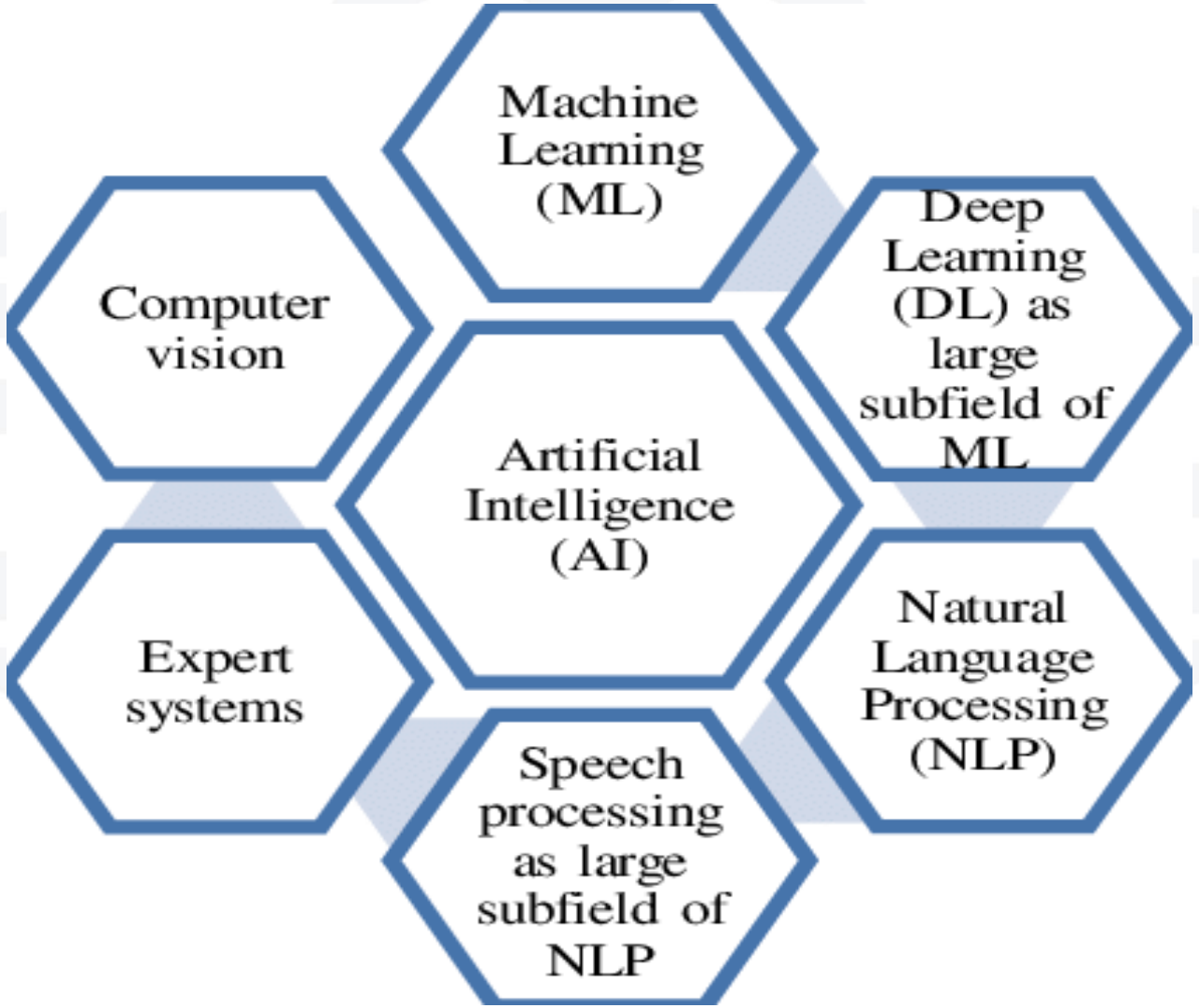
Artificial Intelligence



Machine Learning

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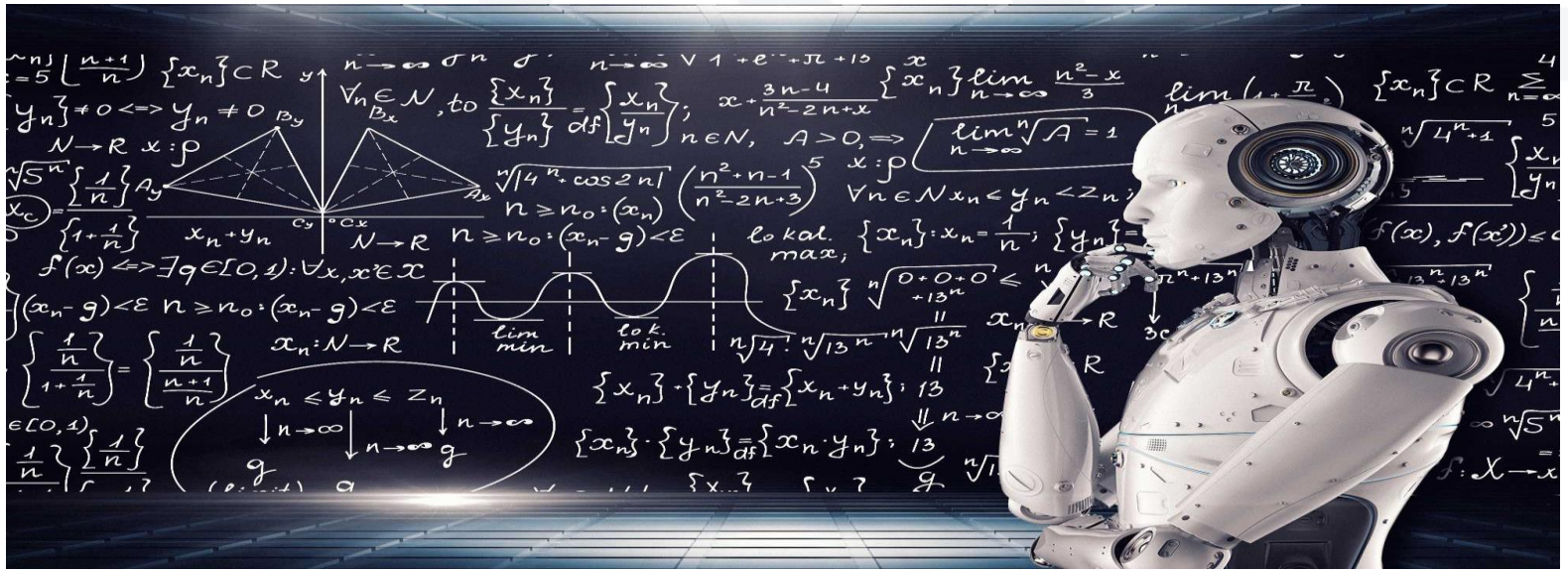
Machine Learning

- **Machine learning (ML)** is a subset of artificial intelligence (AI) that enables computers to learn and improve from experience without being explicitly programmed. It involves the development of algorithms and statistical models that allow systems to automatically learn and make predictions or decisions based on patterns and relationships found within data.



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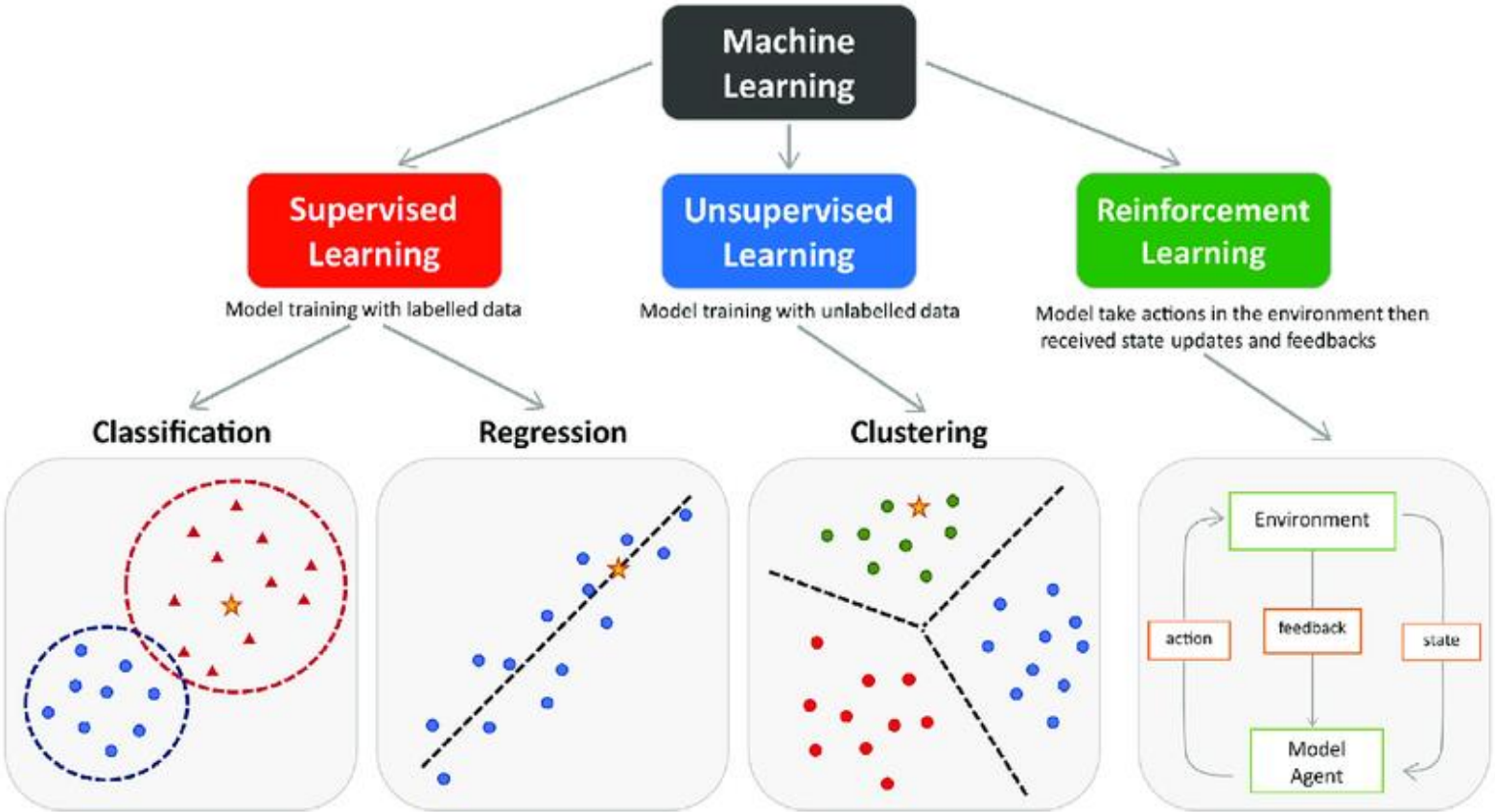
Machine Learning

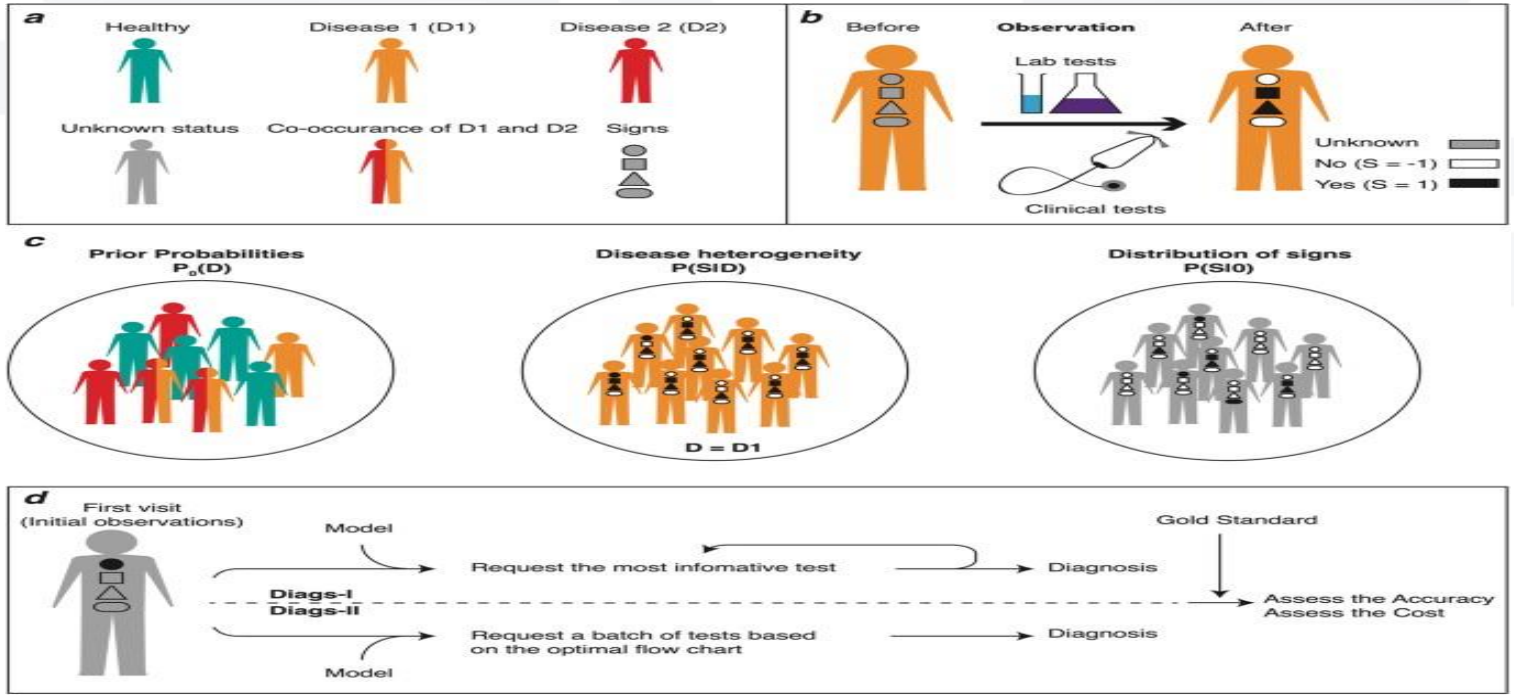


Machine Learning Applications

1. **Stock Price Forecasting**

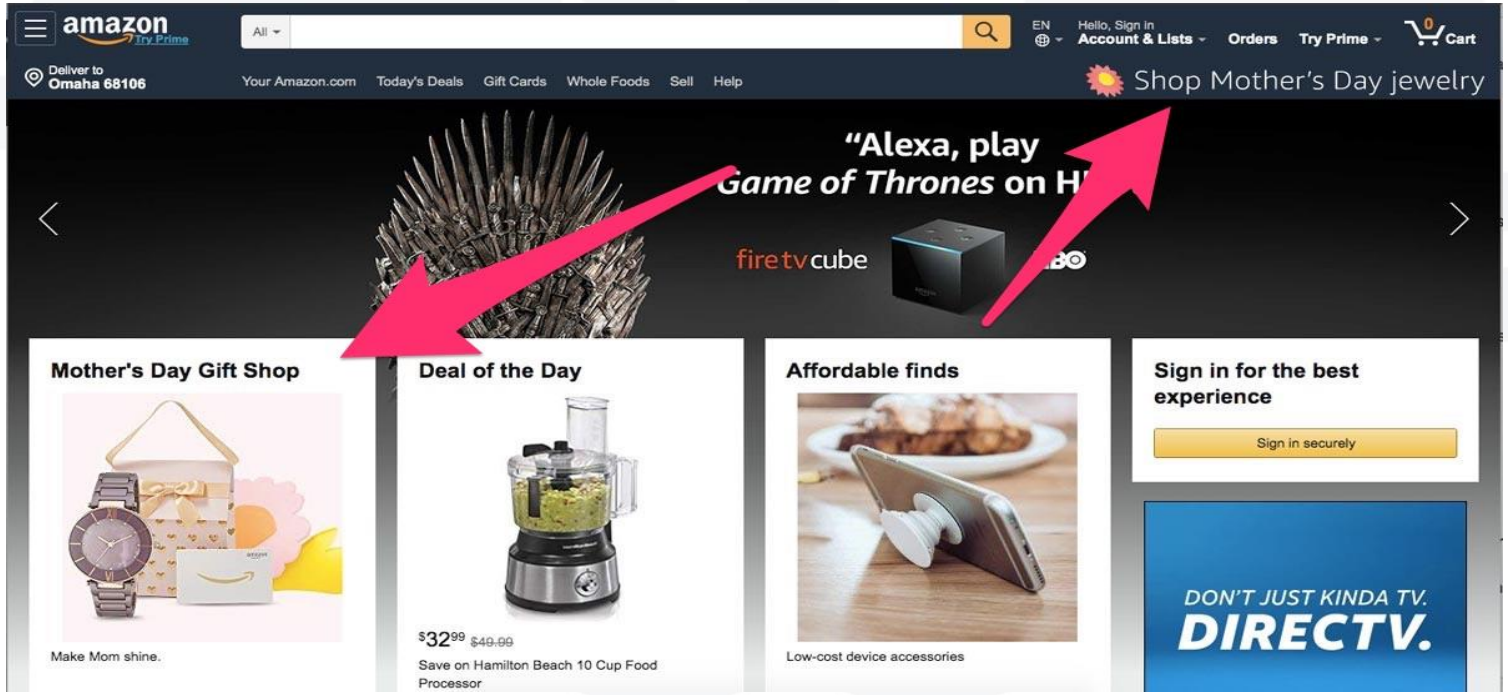
Machine Learning Applications

2. Disease diagnosis



Machine Learning Applications

3. Recommendation System



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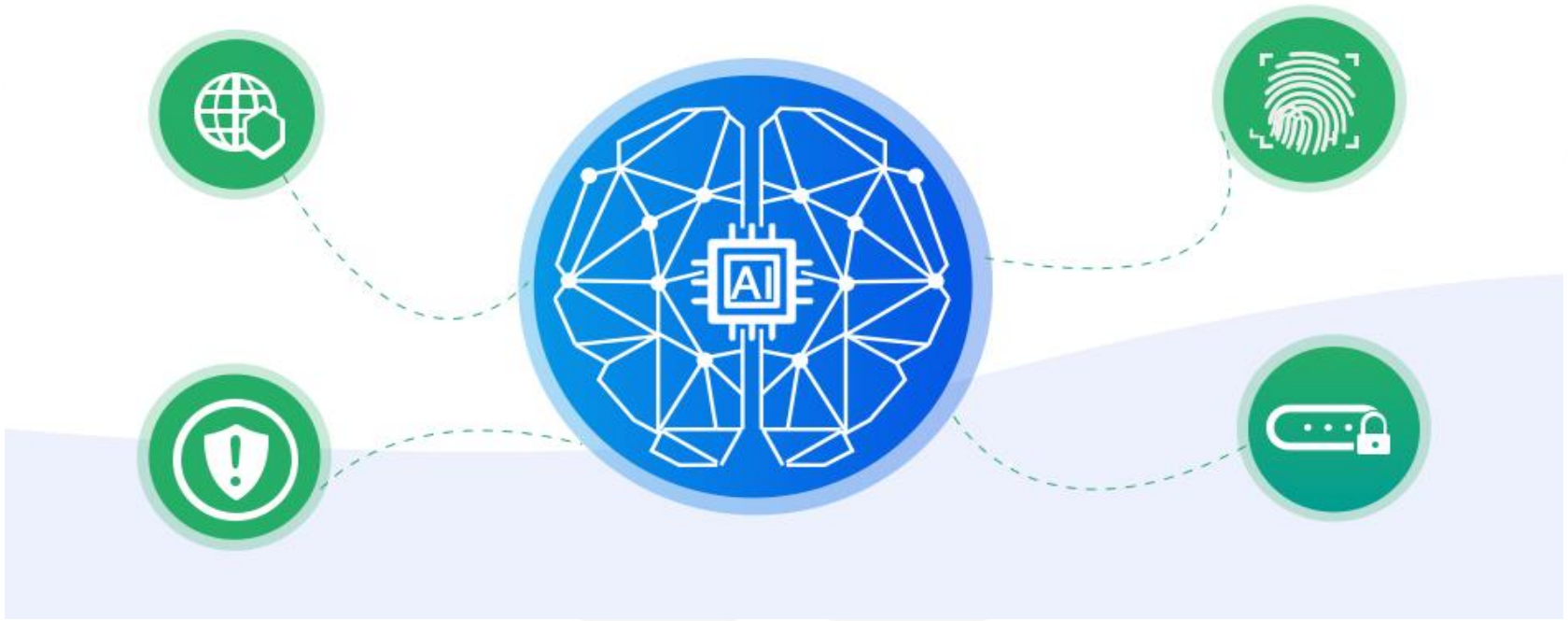
Machine Learning Applications

4. Network Security



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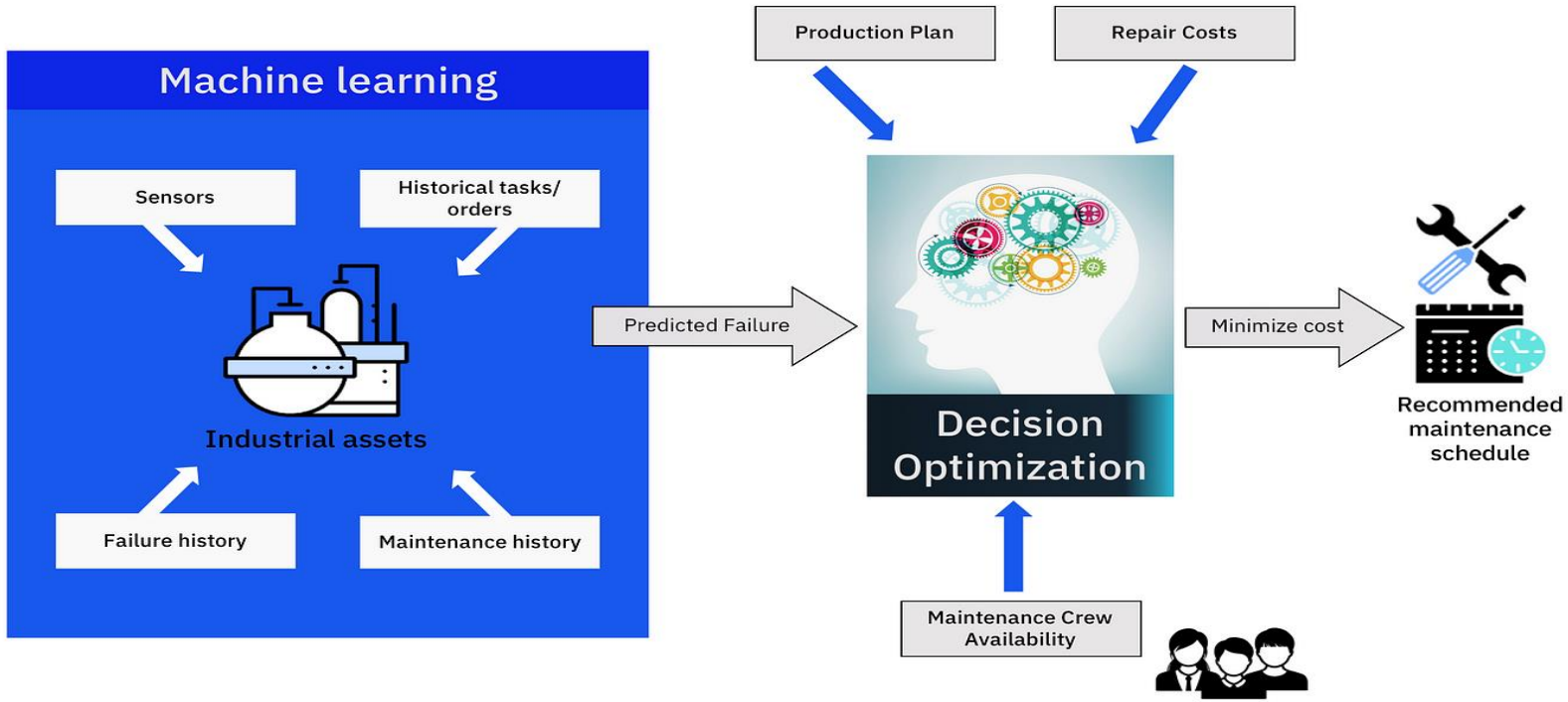
Machine Learning Applications

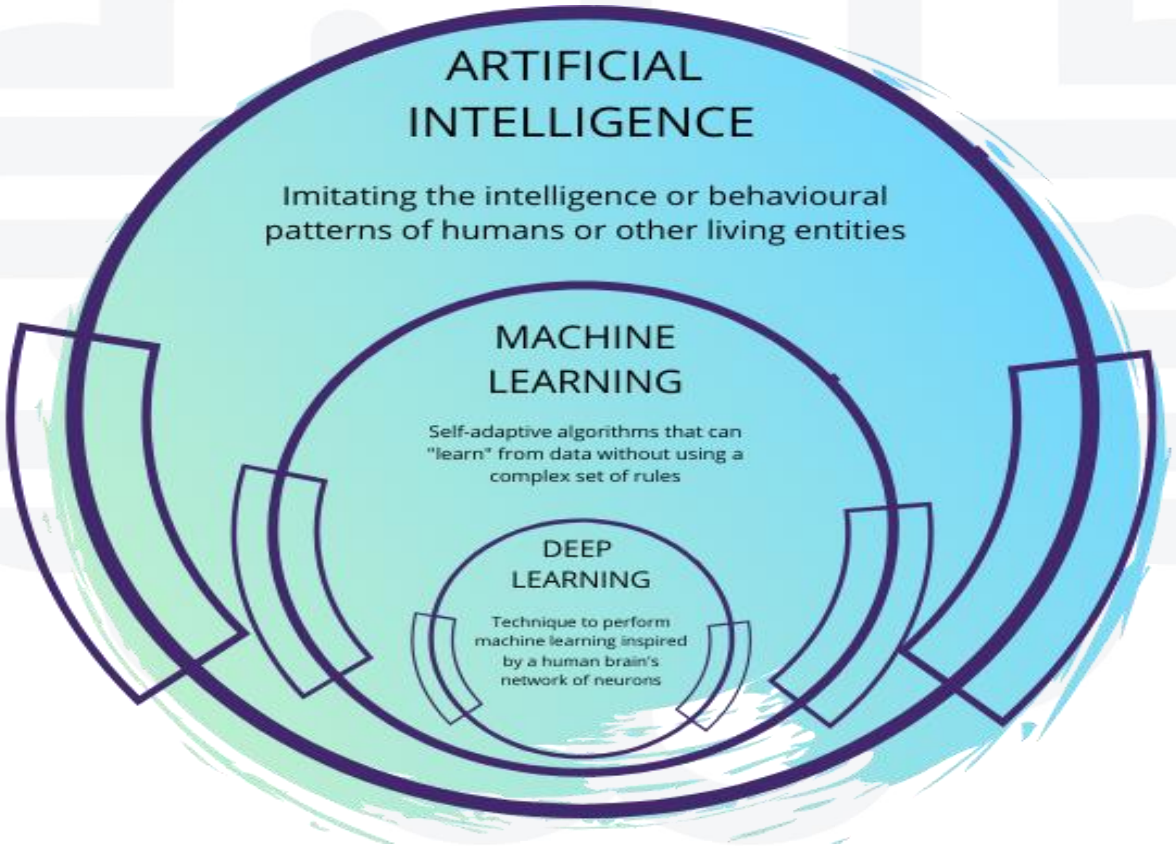
5. Predictive Maintenance



Deep Learning

- Deep learning is a specialized field within machine learning that deals with algorithms inspired by the structure and function of the human brain's neural networks. It involves training artificial neural networks (ANNs) with multiple layers (hence the term "deep") to learn and make intelligent decisions from large volumes of data.

Deep Learning



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Machine Learning

❑Roadmap to get started and progress in machine learning:

1. Learn Python and Libraries:

1.Python Basics:

1. Familiarize yourself with Python programming language fundamentals.

2.Libraries:

1. Learn key libraries like NumPy, Pandas, and Matplotlib for data manipulation, analysis, and visualization.

2. Understand Mathematics and Statistics:

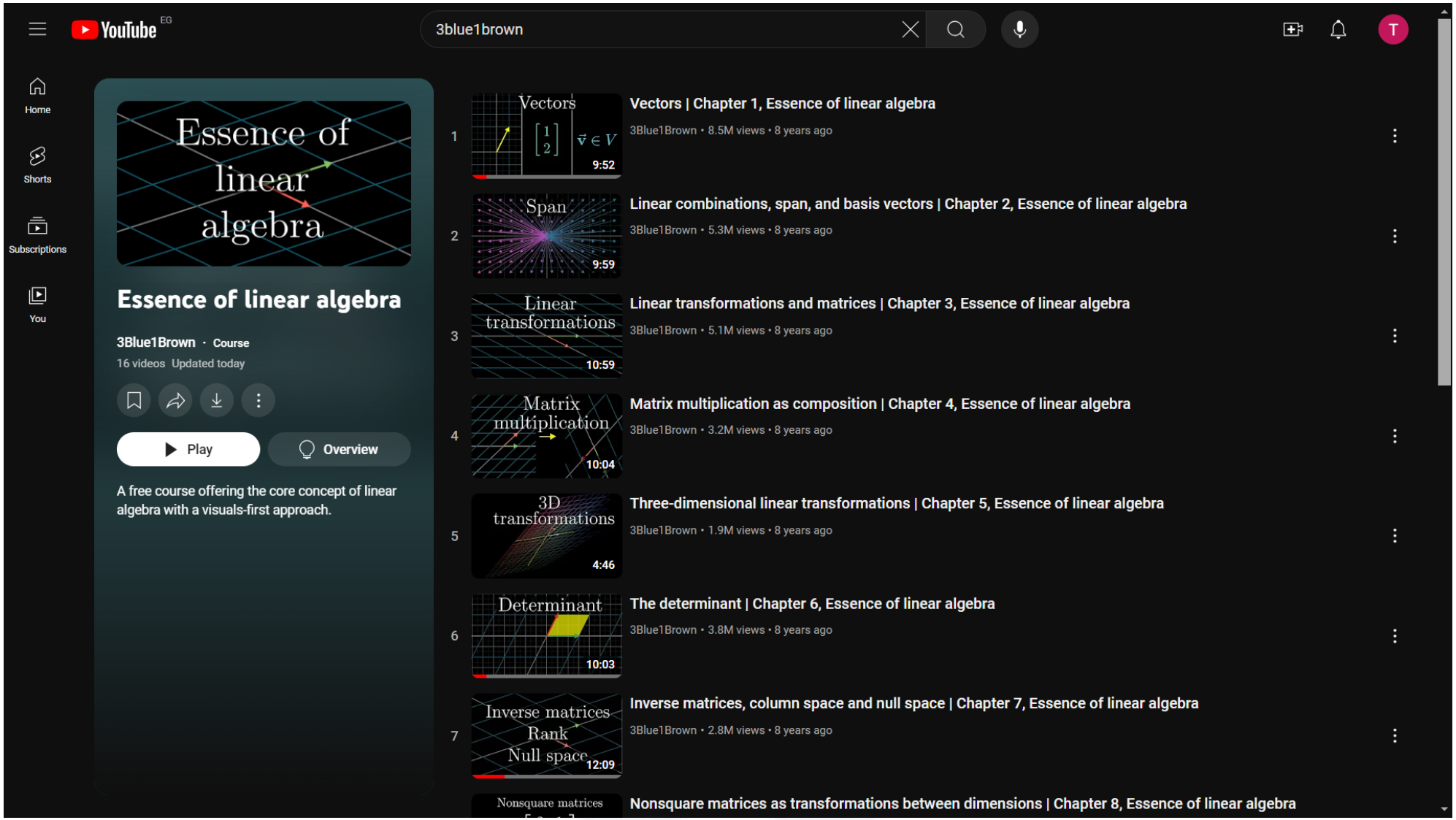
1.Linear Algebra:

1. Study matrices, vectors, and operations used in machine learning algorithms.

2.Probability and Statistics:

1. Learn probability distributions, statistical concepts, and hypothesis testing.

Recommended course (and channel in general)



https://www.youtube.com/playlist?list=PLZHQObOWTQDPD3MizzM2xVFitgF8hE_ab

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Machine Learning

3. Fundamental Concepts of Machine Learning:

- **1.Supervised Learning:**
  1. Understand regression, classification, and various algorithms .
- **2.Unsupervised Learning:**
  1. Study clustering, dimensionality reduction, and algorithms.
- **3.Model Evaluation:**
  1. Learn about evaluation metrics .

4. Deepen Knowledge:

- **1.Feature Engineering:**
  1. Understand feature selection, extraction, and transformation techniques.
- **2.Ensemble Methods:**
  1. Study bagging, boosting, and stacking techniques to combine multiple models.
- **3.Neural Networks and Deep Learning:**

5. Practical Application and Projects:

- **1.Practice on Datasets**
- **2.Build Projects**

Computer Vision

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Computer Vision

- **Computer vision** is a field of artificial intelligence and computer science that focuses on enabling machines to interpret and understand visual information from the real world. It involves developing algorithms and techniques that allow computers to gain a high-level understanding of digital images or videos, similar to human visual perception.

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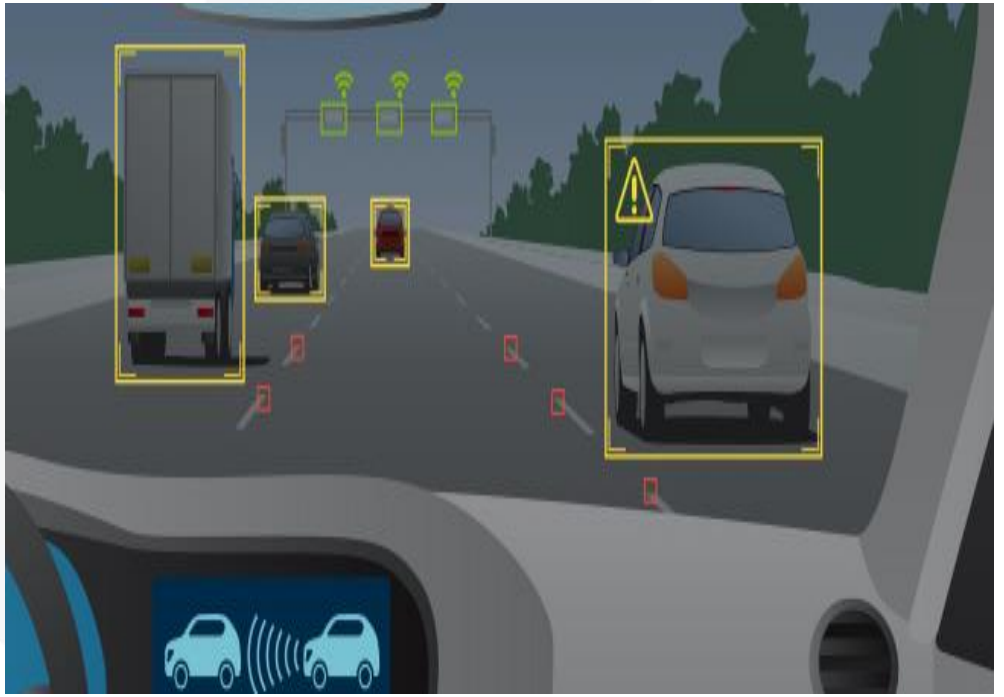
Computer Vision Applications

1. Autonomous Vehicles



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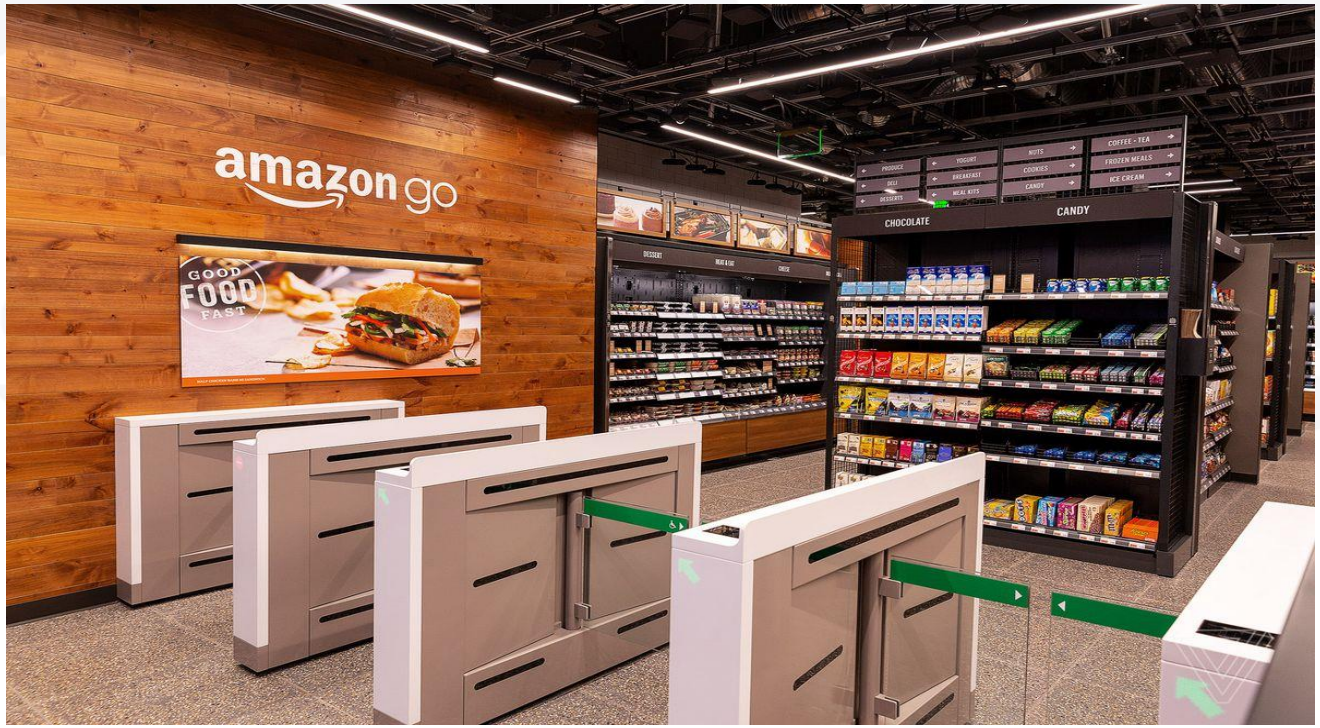
Computer Vision Applications

2. Retail and E-commerce

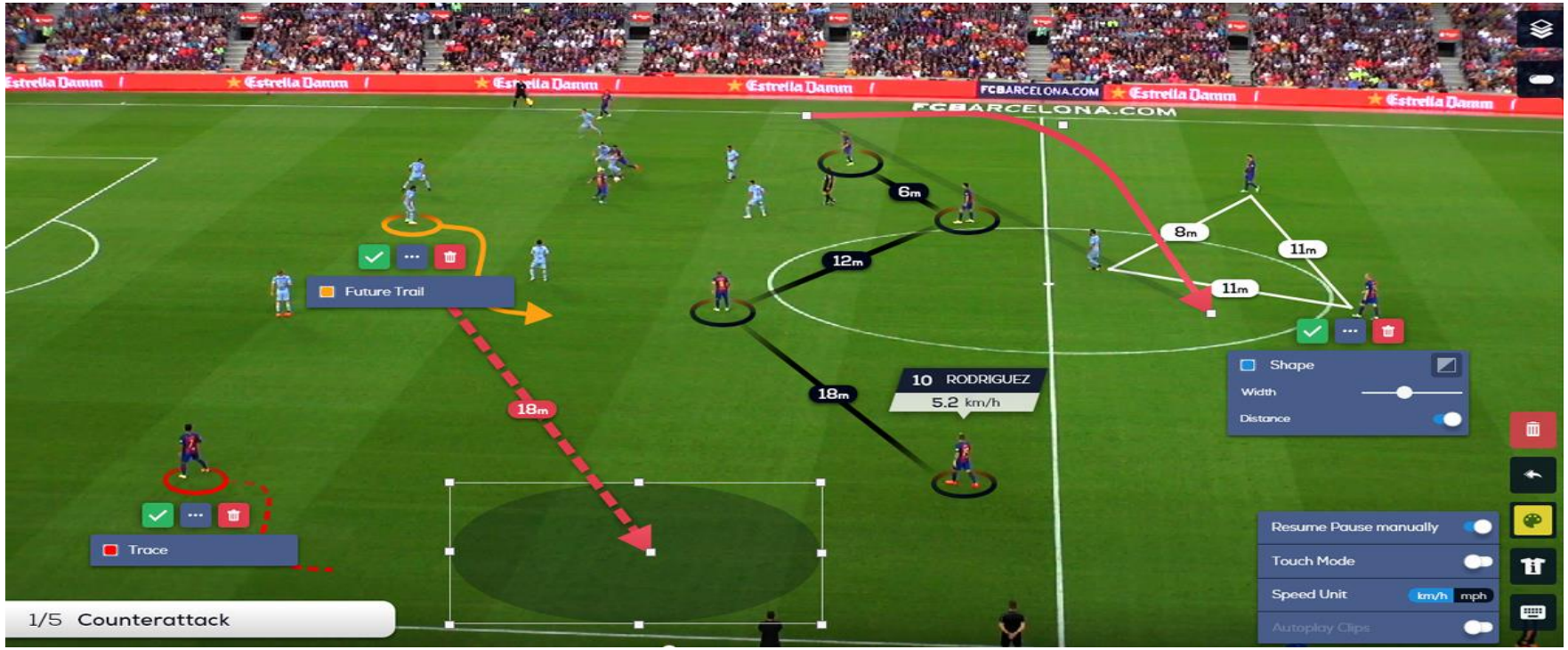


Computer Vision Applications

3. Robotics

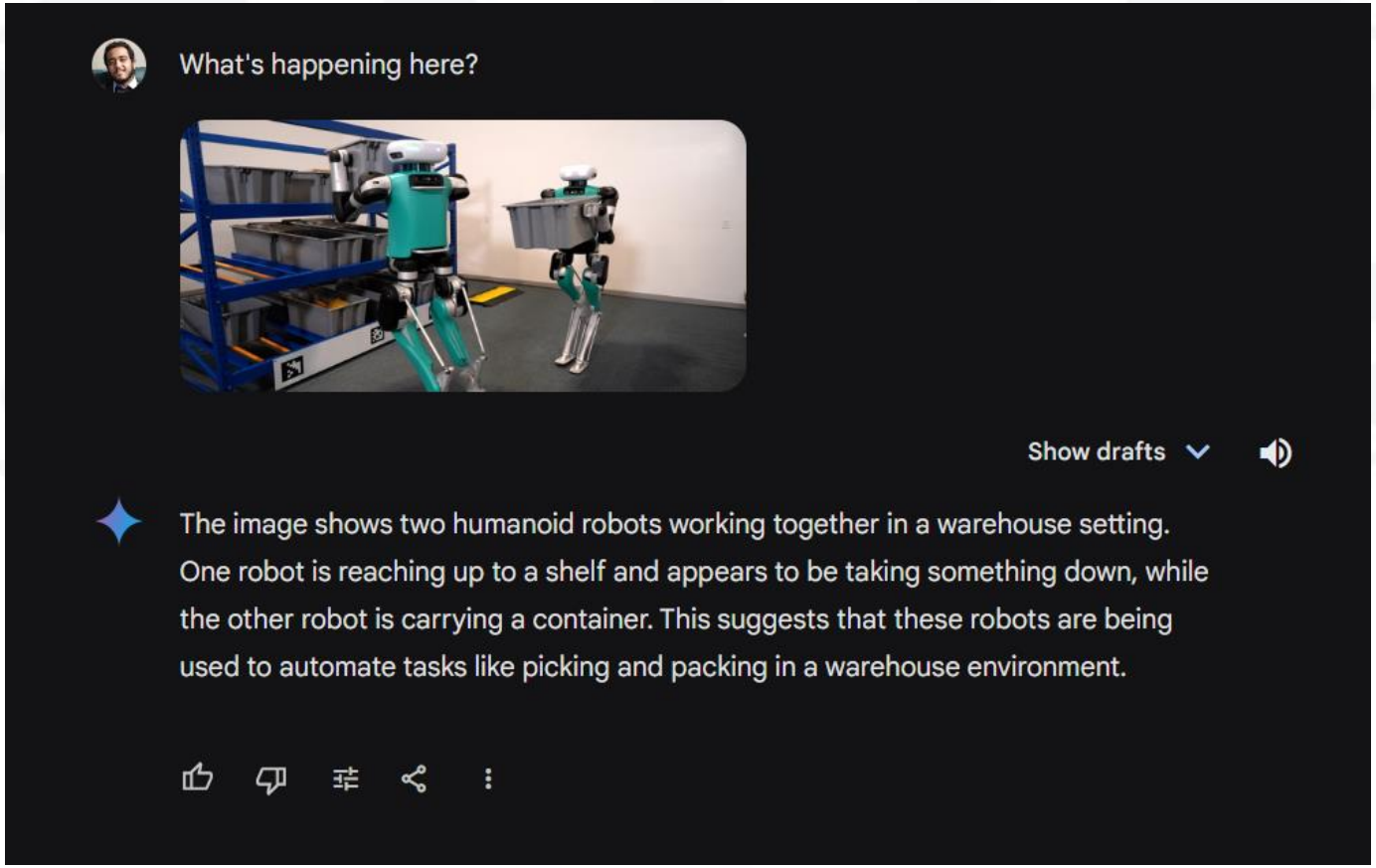
Computer Vision Applications

4. Sports Analytics



Computer Vision Applications

5. Image description



Computer Vision

❑ **Roadmap to get started and progress in Computer Vision :**

1. Basics of Python and Libraries:

- **Python Fundamentals:** Learn the basics of Python programming.
- **Libraries:** Familiarize yourself with libraries like NumPy, OpenCV, Matplotlib for image manipulation and processing.

2. Image Processing Fundamentals:

- **Understand Images:** Learn about pixel manipulation, color spaces, and image representation.
- **Filters and Transformations:** Study filters (blurring, sharpening) and geometric transformations.

3. Introduction to Computer Vision:

- **Object Recognition:** Explore basic object recognition and feature detection techniques (edges, corners).
- **Image Segmentation:** Understand how to segment images into meaningful parts or regions.

Computer Vision

4. OpenCV Library:

- **OpenCV Basics:** Dive into OpenCV, a popular computer vision library, to perform various image processing tasks.
- **OpenCV Functions:** Explore OpenCV functions for image manipulation, feature detection, and object recognition.

5. Machine Learning and Deep Learning for Computer Vision:

- **Machine Learning Basics:** Learn about supervised and unsupervised learning.
- **Deep Learning**

6. Advanced Topics:

- **Object Detection Algorithms:** Study advanced algorithms like YOLO (You Only Look Once) or Faster R-CNN for object detection.
- **Pose Estimation**
- **Image Generation:** Explore generative models such as GANs (Generative Adversarial Networks) for image generation

Natural Language Processing

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Natural Language Processing

- **Natural Language Processing (NLP)** is a field of artificial intelligence and linguistics that focuses on enabling computers to understand, interpret, and generate human language in a way that is both natural and meaningful. It involves the development of algorithms and models to analyze and derive meaning from textual or spoken data.

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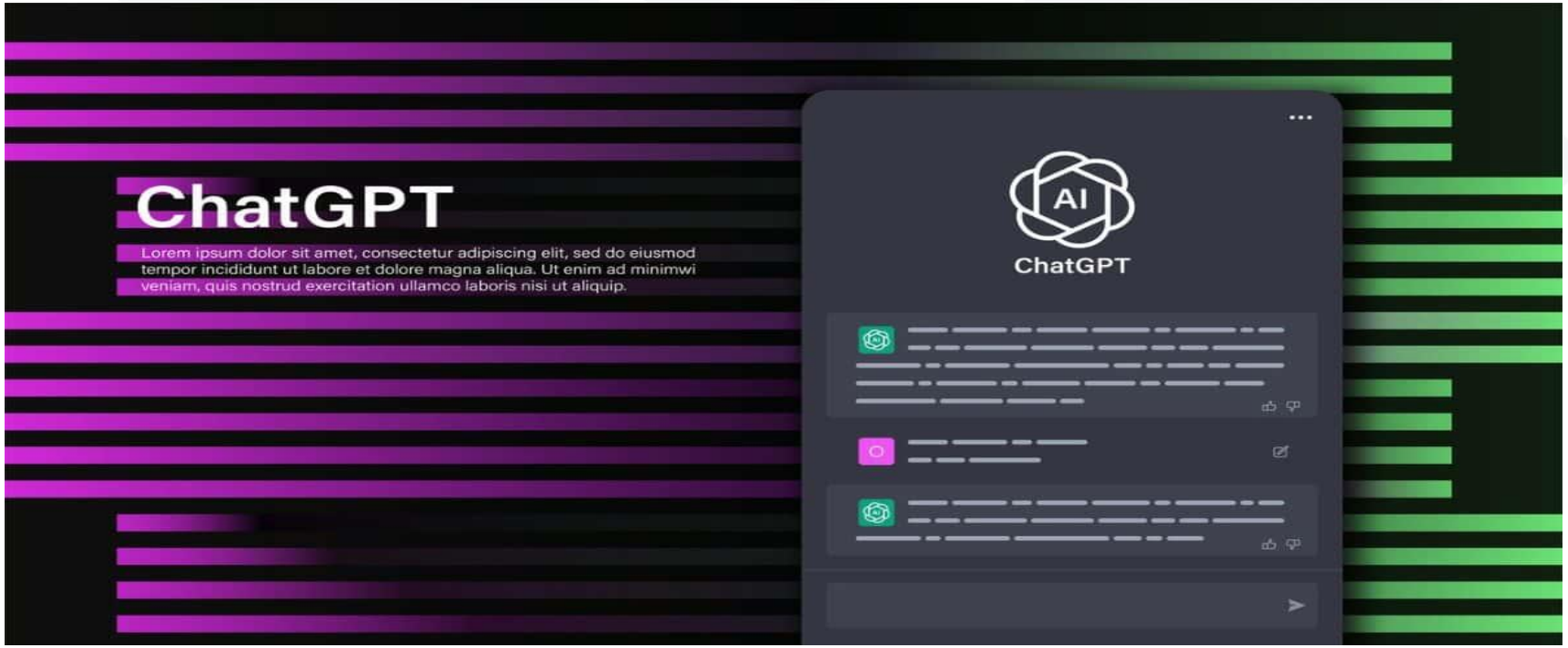
Natural Langue Processing

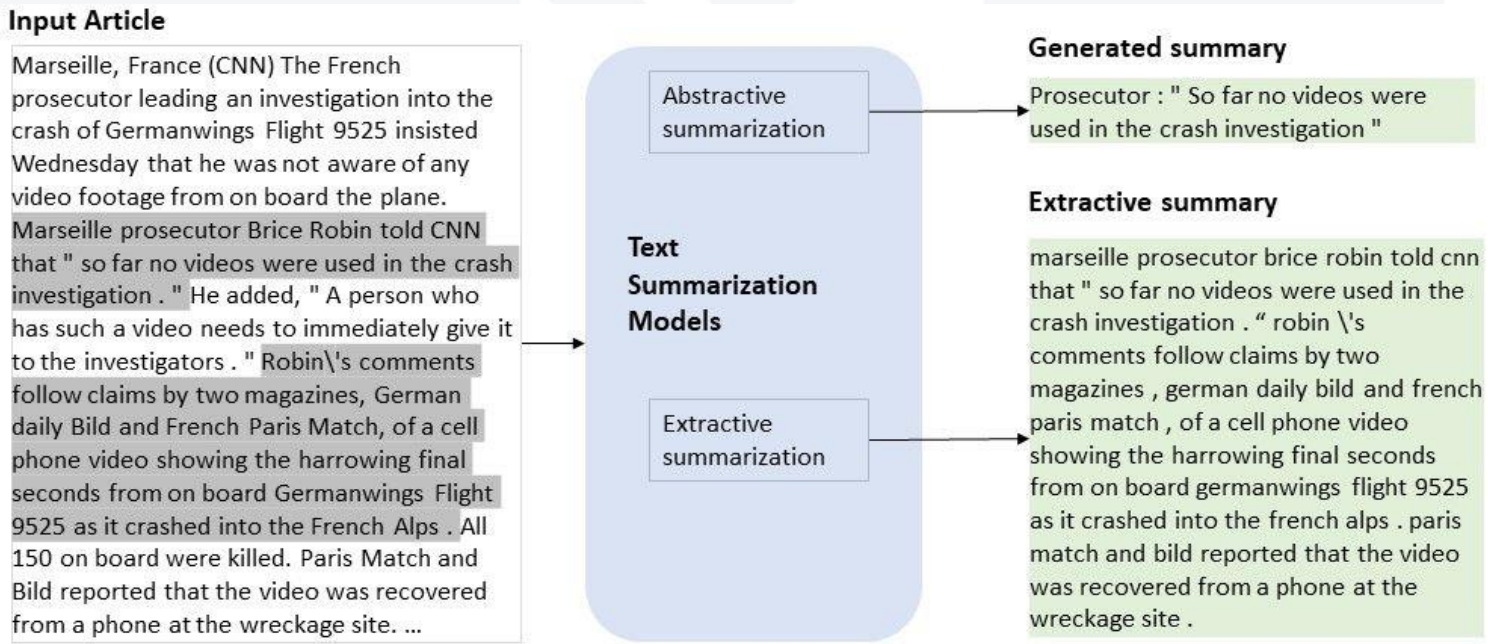
Natural Language Processing Applications

1. **Chatbots and Virtual Assistants:**



Natural Language Processing Applications

2. Text Summarization and Generation

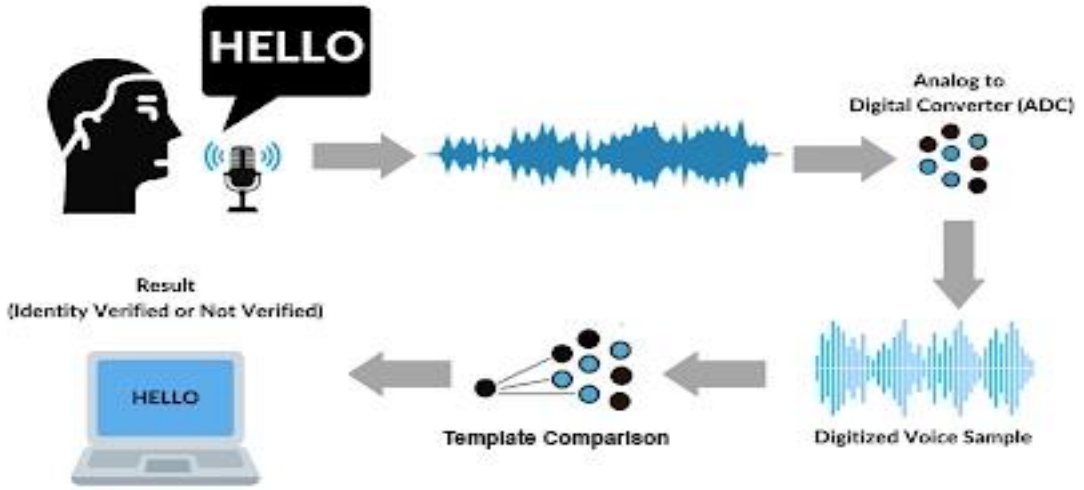


Natural Language Processing Applications

3. Semantic Search

Natural Language Processing Applications

4. Speech Recognition and Voice Assistants



Natural Langue Processing

❑ **Roadmap to get started and progress in Natural Language Processing:**

1. Python and Libraries:

1.Python Fundamentals: Learn Python basics and its data structures.

2.NLP Libraries: Familiarize yourself with libraries like NLTK (Natural Language Toolkit), spaCy, and Transformers (using Hugging Face) for NLP tasks.

2. Basic NLP Concepts:

1.Text Preprocessing

2.Speech Preprocessing

3. NLP Tasks:

1.Text Classification: Understand classification techniques for sentiment analysis, spam detection, etc.

2.Text Generation: Explore techniques for text generation using language models (e.g., GPT models).

Natural Langue Processing

4. **Deep Learning for NLP:**
    1. **Neural Network Architectures:** Learn about building and training neural networks for NLP tasks.
    2. **Transfer Learning:** Explore pre-trained language models like BERT, GPT, and their fine-tuning for specific tasks.
5. **Advanced NLP Concepts:**
    1. **Word Embeddings:** Dive into word vectors (Word2Vec, GloVe) for representing words in numerical form.
    2. **Sequence-to-Sequence Models:** Understand models like LSTM, GRU, and Transformer architectures.
    3. **Attention Mechanisms:** Study attention-based models for handling long-range dependencies in sequences.
    4. **Transformers**
6. **Advanced NLP Applications:**
    1. **Machine Translation:** Dive into building sequence-to-sequence models for translation tasks.
    2. **Question Answering Systems:** Create systems that can answer questions based on given context.
    3. **Summarization and Generation:** Develop models for text summarization and content generation.

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About Us

- We leading provider of specialized education and technical services. With a passion for learning and a focus on excellence, we offer a range of educational programs and technical solutions.

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Our Mission

- Our Mission is to be a leader in the field of AI and data science education and technical services. We believe that AI has the power to transform industries and drive innovation, and we want to play a key role in helping individuals and organizations unlock this potential. Our goal is to provide accessible and practical AI education to people from all backgrounds and skill levels, and to help businesses of all sizes implement AI solutions that drive growth and success. We are constantly striving to stay at the forefront of the latest AI technologies and trends, and to innovate new solutions that can make a positive impact on society. At our AI company, we believe that the future of AI is bright, and we are committed to being a part of that future

Our Vision

- Our company offers comprehensive AI and data science courses designed to equip clients with the knowledge and skills necessary for success in the field. We cater to beginners, intermediate, and advanced learners, focusing on practical applications of machine learning, deep learning, NLP, and computer vision. Our teaching methods include lectures, hands-on exercises, and projects for a well-rounded education. Additionally, we provide technical services such as personalized consultation, data analysis, AI model development, project management, and technical support. Our commitment is to deliver top-quality courses and services that empower clients to maximize the potential of AI and data science in their businesses.

Our Services

- Training Services
- Technical Services

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Technical Services

- Artificial Intelligence
- Data Science
- Big Data
- Web Development
- Mobile Development
- Desktop Development
- Cyber Security

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Training Services

ARTIFICIAL INTELLIGENCE

DATA SCIENCE

BIG DATA

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Any Question?

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Thanks

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