Welcome to Huawei HCCDA-AI Certification Course

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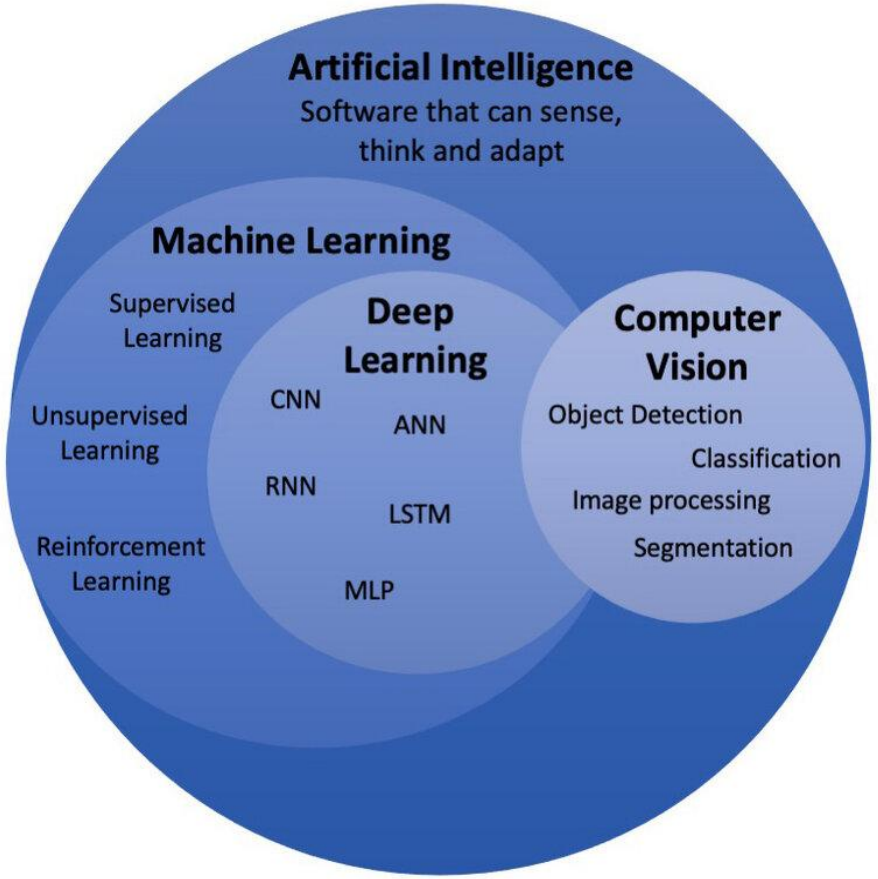
Course Introduction

- **Course Title:** HCCDA-Artificial Intelligence
- **Objective of Course:**
  - Understanding of core concepts of Artificial Intelligence, Machine Learning and Deep Learning
  - Explore Python libraries and deep learning frameworks
  - Gain hands-on experience with Exploratory Data Analysis (EDA)
  - Learn practical model design and evaluation techniques
  - Become familiar with tools such as Scikit-learn, PyTorch, and Huawei Cloud AI Services
  - Use Huawei Cloud AI services effectively for development and deployment
  - Develop Real-world AI applications
  - Prepare candidates for the Huawei HCCDA-AI certification
- **Course Execution Plan:**
  - **Total Duration of Course:** 3 Months
  - **Class Hours:** 4 Hours per day
  - **Days:** Saturday and Sunday

Course Overview

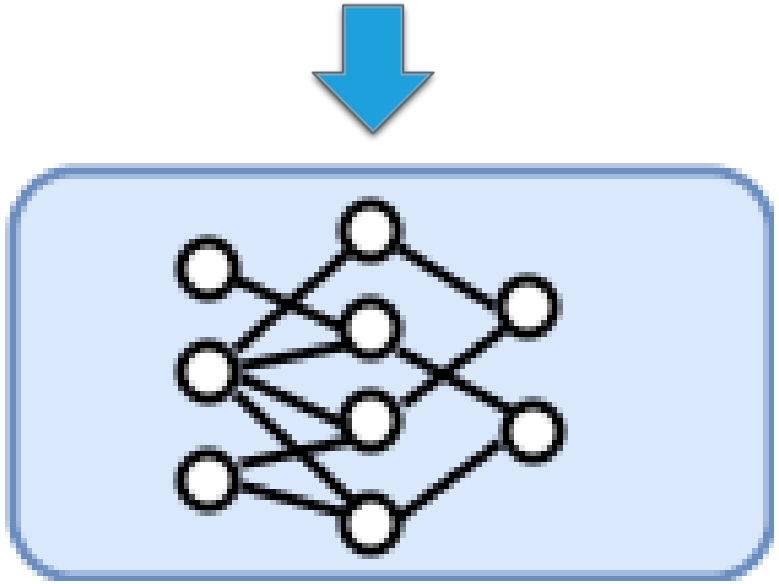
- **Python**
  - Python Fundamentals
- **Exploratory Data Analysis**
  - NumPy
  - Pandas
  - Data Visualization
    - Matplotlib
    - Seaborn
- **Machine Learning**
- **Deep Learning**
  - Convolutional Neural Networks (Deep Computer Vision)
  - Sequence Learning
  - Deep Generative AI
  - Large Language Models
- **Huawei Cloud AI Services**
  - ModelArts (AI Development Platform)
  - DAYU (Data Processing)
  - AI Gallery & Pre-trained Models
  - …



Artificial Intelligence

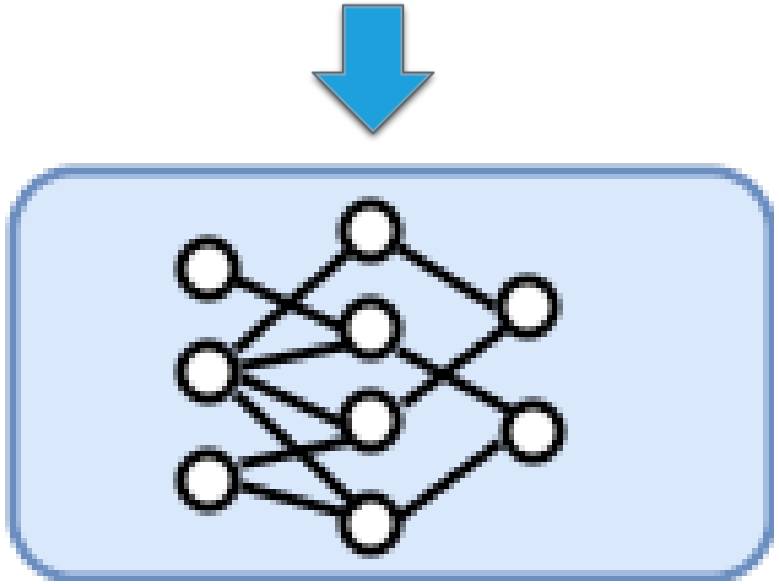
Generating Images from Natural Language

"A photo of an astronaut riding a horse."



Generating Language from Natural Language

"Write code in TensorFlow to train a neural network"



Certainly! Here is an example of how you can use TensorFlow to train a neural network for binary classification:

Copy code

```
import tensorflow as tf

# Load the data
(x_train, y_train), (x_test, y_test) = load_data()

# Define the model
model = tf.keras.Sequential([
    tf.keras.layers.Input(shape=x_train.shape[1:]),
    tf.keras.layers.Dense(16, activation='relu'),
    tf.keras.layers.Dense(1, activation='sigmoid')
])

# Compile the model
model.compile(optimizer='adam', loss='binary_crossentropy', metrics=
['accuracy'])

# Train the model
model.fit(x_train, y_train, epochs=10, batch_size=32, validation_data=
(x_test, y_test))
```

This code assumes that you have a function `load_data()` that returns the training and test datasets as tuples of NumPy arrays. The input shape of the model is determined by the shape of the training data, and the model has two dense layers with 16 and 1 units, respectively, with ReLU and sigmoid activations. The model is then compiled with an Adam optimizer and a binary cross-entropy loss function, and is trained using the `fit()` method.

I hope this helps! Let me know if you have any questions.

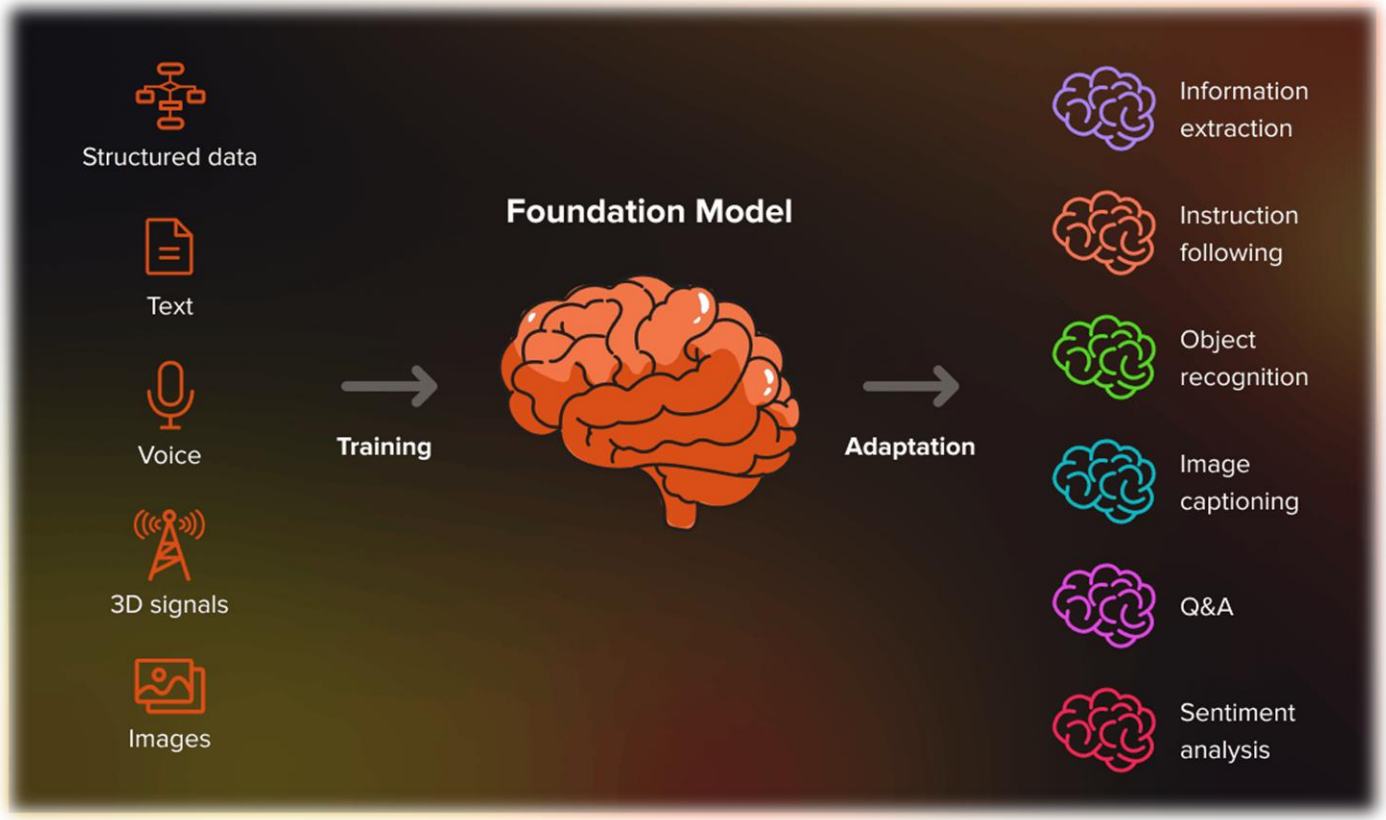
Deep Fake Video

[Courtesy of Alexander Amini]

Artificial Intelligence in 2025:

Multimodal Foundation Models

- Modern AI systems can understand and generate text, images, audio, and video, enabling more natural and human-like interactions across formats.
- **Examples:**
- GPT-5 (OpenAI), Claude 3.7 (Anthropic), Gemini 1.5 (Google DeepMind), Grok (xAI), Fuyu (Perplexity)



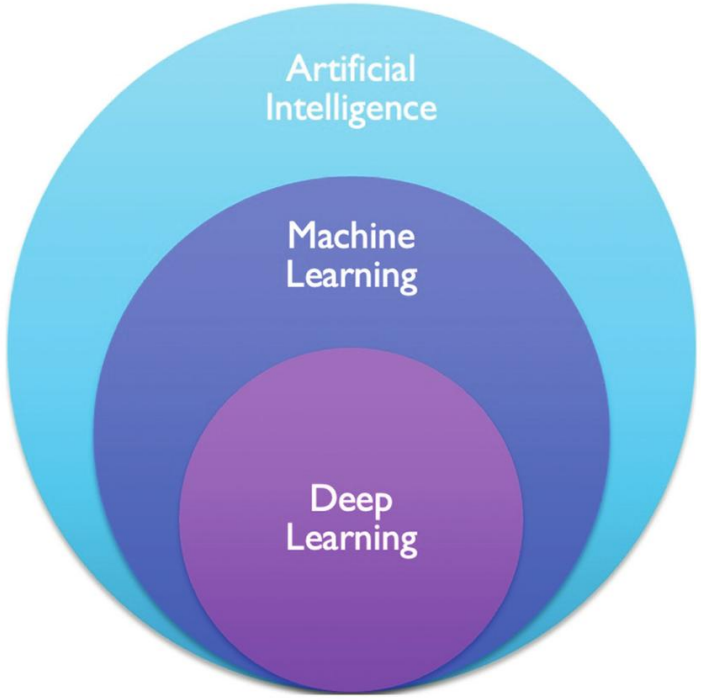
Artificial Intelligent (AI)

- Artificial Intelligence is the study of how to make computers do intelligent jobs that only human could do in the past.

Like;

- learning
- reasoning
- problem-solving
- perception, and language understanding

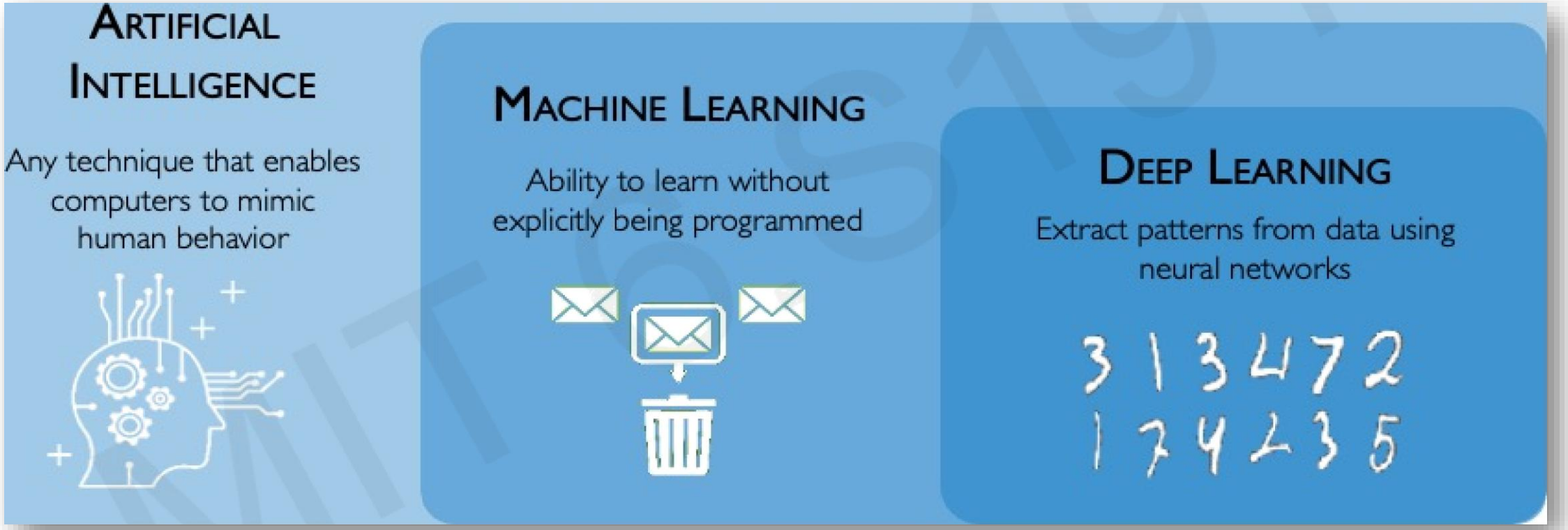
- **Key components:**
  - Machine Learning
  - Deep Learning
  - Natural Language Processing (NLP)
  - Robotics.



Why Study AI Now?

- Increasing demand for AI expertise.
- Impact on industries such as healthcare, finance, retail, and autonomous systems.
- Opportunities for innovation in personal and professional settings.

Artificial Intelligence



Why Now?

Neural Networks date back decades, so why the dominance?

1952 Stochastic Gradient Descent

1958 Perceptron
- Learnable weights

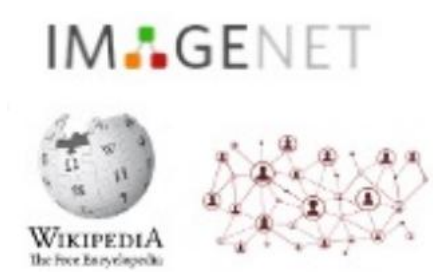
1986 Backpropagation
- Multi-Layer Perceptron

1995 Deep Convolutional NN
- Digit Recognition

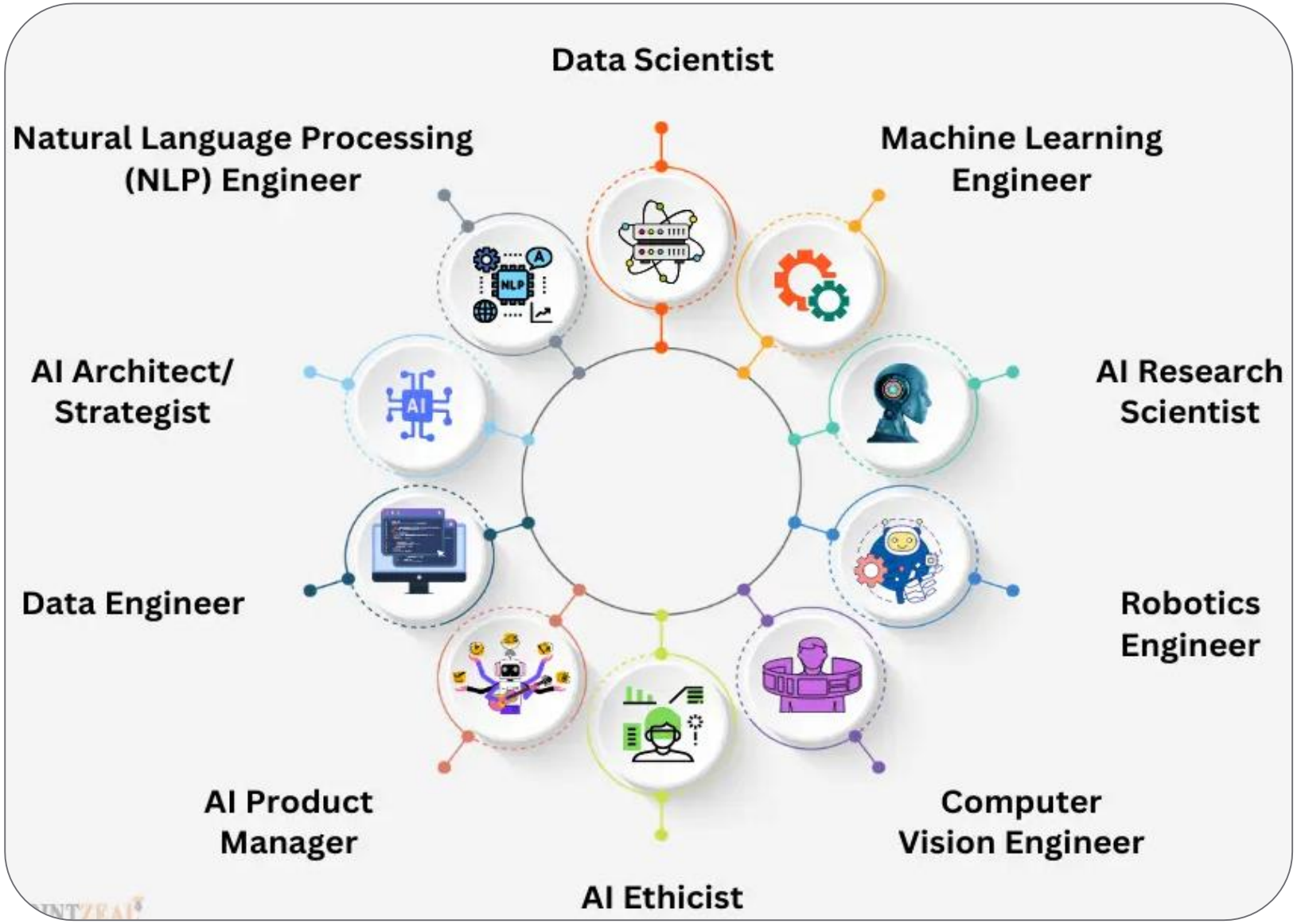
1) Big Data
- Larger Datasets
- Easier Collection & Storage

2) Hardware
- Graphics Processing Units (GPUs)
- Massively Parallelizable

3) Software
- Improved Techniques
- New Models
- Toolboxes



Career Opportunities in Artificial Intelligence



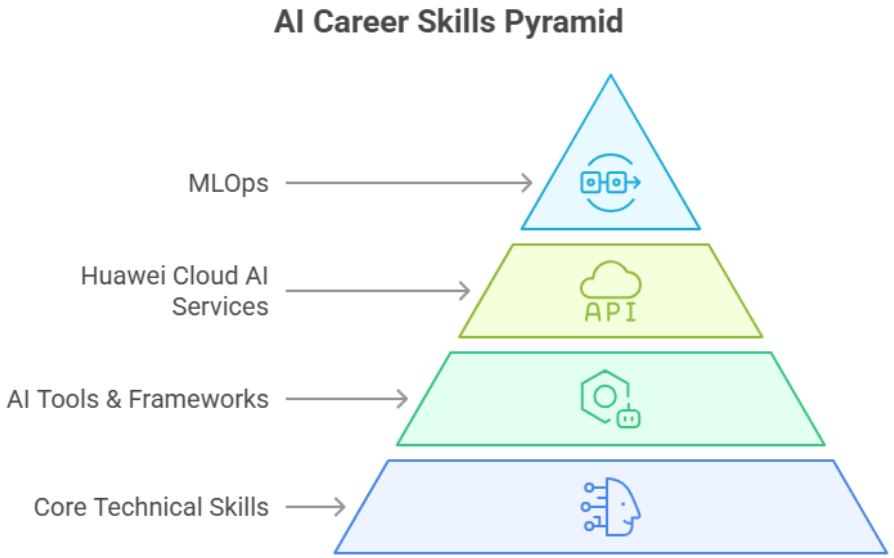
Skills to Build Career in AI

Core Technical Skills

- **Programming**: Python
- **Statistics & Mathematics**: Probability, Linear Algebra, Calculus
- **Machine Learning Algorithms**: Supervised/Unsupervised Learning
- **Deep Learning**: Neural Networks, CNN, RNN, Transformers
- **Data Processing**: Cleaning, Feature Engineering
- **Cloud & Big Data**: Distributed Computing, Scalability

AI Tools & Frameworks

- **ML Libraries**: Scikit-learn, TensorFlow, PyTorch
- **Data Tools**: NumPy, Pandas
- **Visualization**: Matplotlib, Seaborn
- **Huawei Cloud AI Services**: ModelArts, HiLens, DAYU
- **MLOps**: Model Deployment, Monitoring, Maintenance



Getting Started with Essential Tools

Anaconda

- An open-source distribution of Python and R for data science and machine learning.
- Includes pre-installed libraries such as NumPy, Pandas, Matplotlib, and more.

Why Install Anaconda?

- Simplifies package management and deployment.
- Ideal for creating isolated environments for projects.
- Comes with Jupyter Notebook for interactive coding.

Visual Studio Code

- Lightweight and highly customizable.
- Extensions for Python, Jupyter, and Git integration.
- Debugging, version control, and support for multiple programming languages.

Thank You