

# Understanding Foundation Models

Instructor

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# Introduction to Foundation Models



## Foundation Models

- Coined in 2001 by the Stanford Team
- Concept inspired from the self-supervised learning

# Introduction to Self-Supervised Learning

## Supervised Learning

- Performs well on labeled data
- Decent amount of labeled data is needed
- Label Creation is a manual process

## Unsupervised Learning

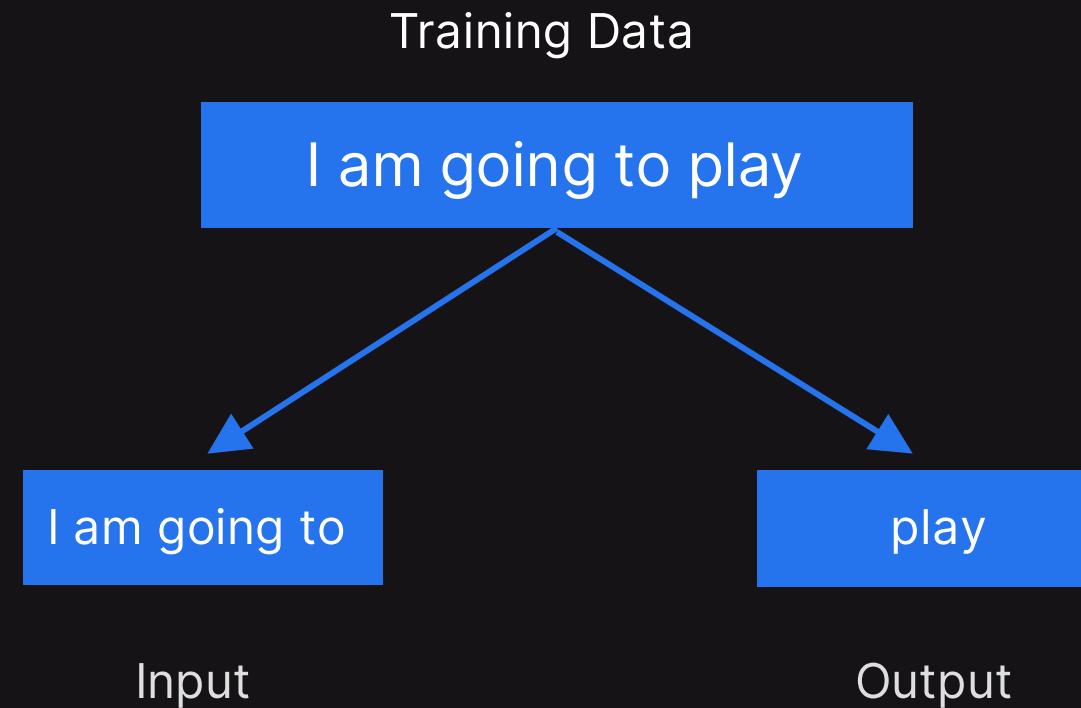
- Performs well on unlabeled data
- Not really effective compared to supervised learning

## Self-Supervised Learning

- No external labeled dataset is needed
- Training labels are created for free from the unlabeled dataset

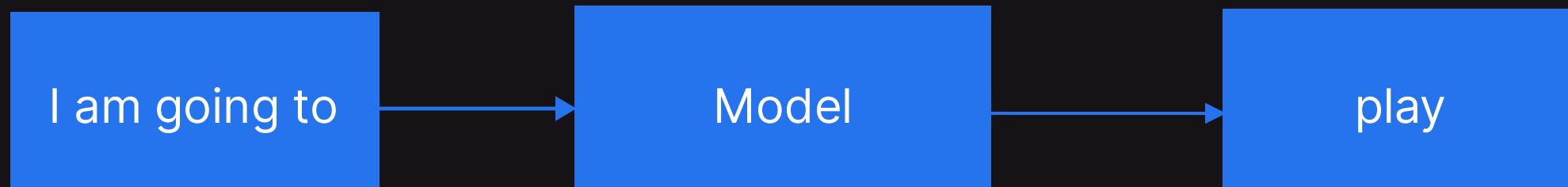
# What is Self Supervised Learning?

Next word prediction



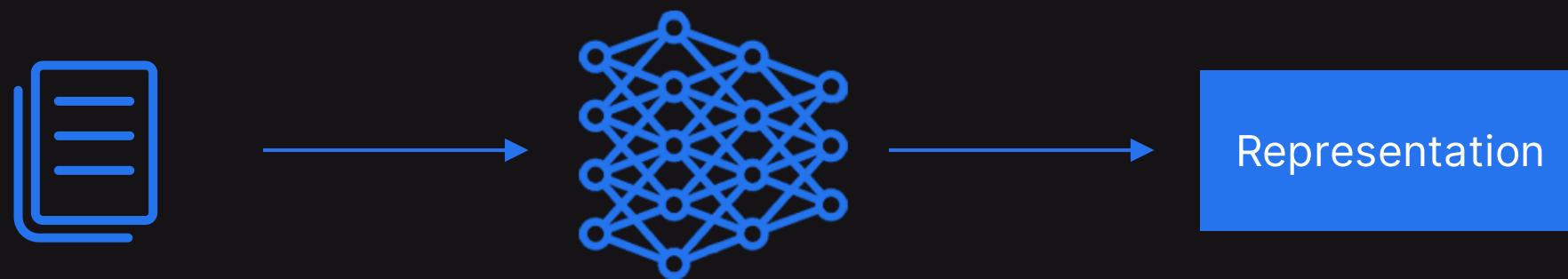
# What is Self Supervised Learning?

Next word prediction



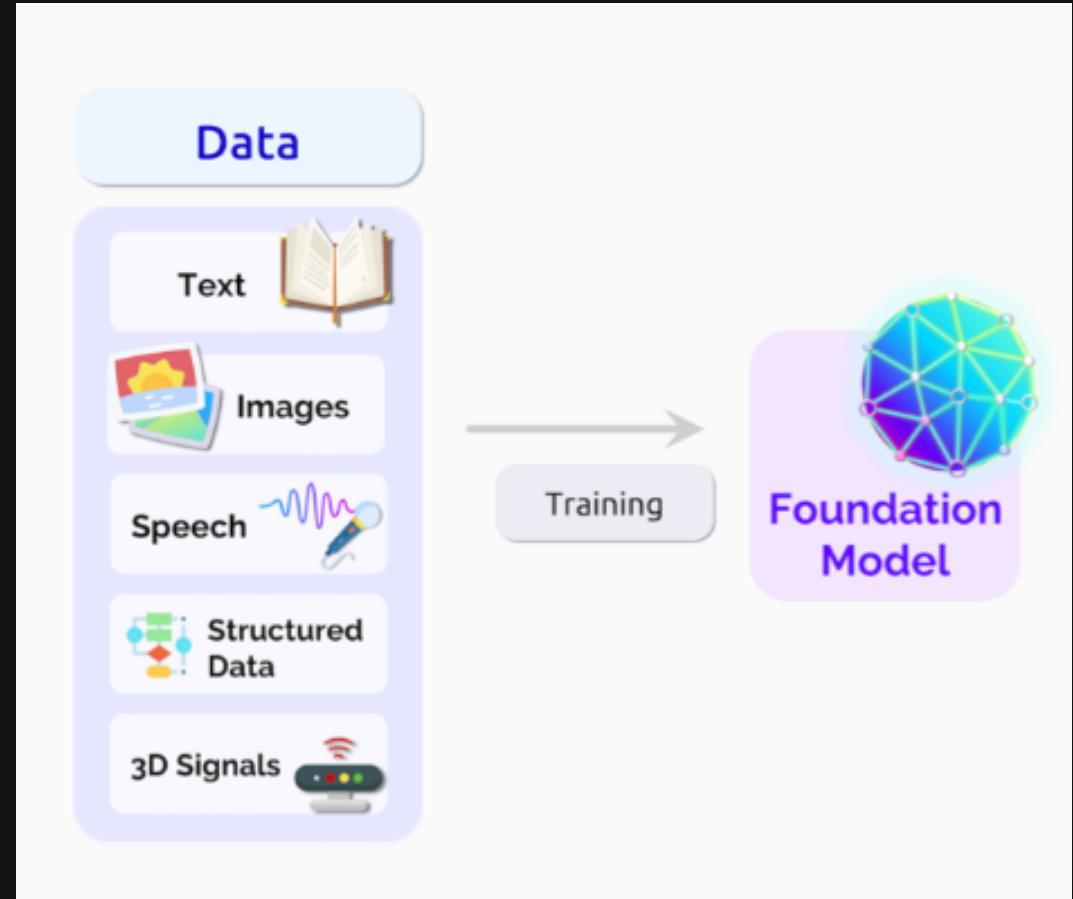
# What is Self Supervised Learning?

Self Supervised Learning learns the representation form the unlabeled data.

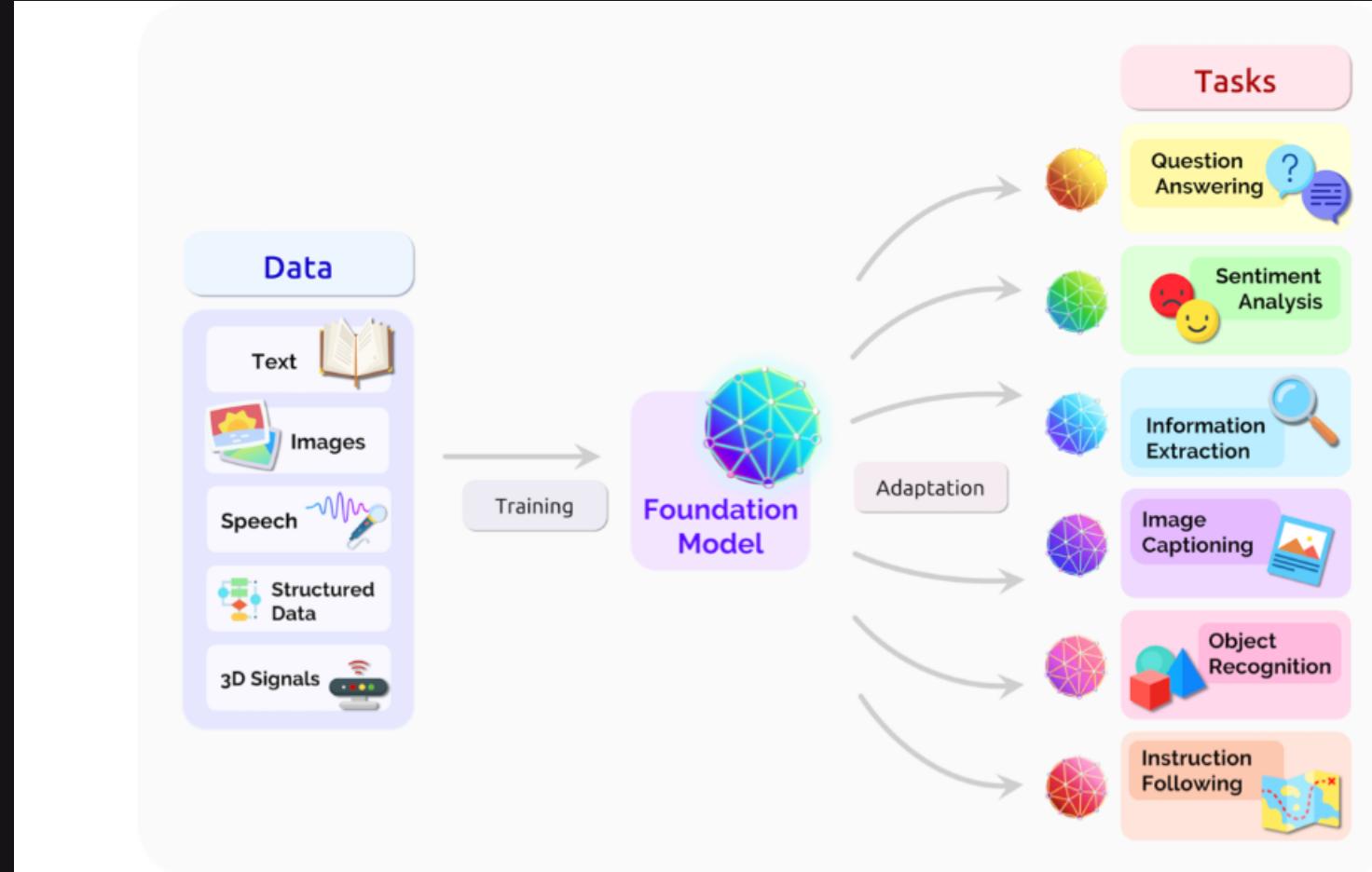


# Understanding Foundation Model

AI model trains on very large "unlabeled" datasets using self-supervised learning.

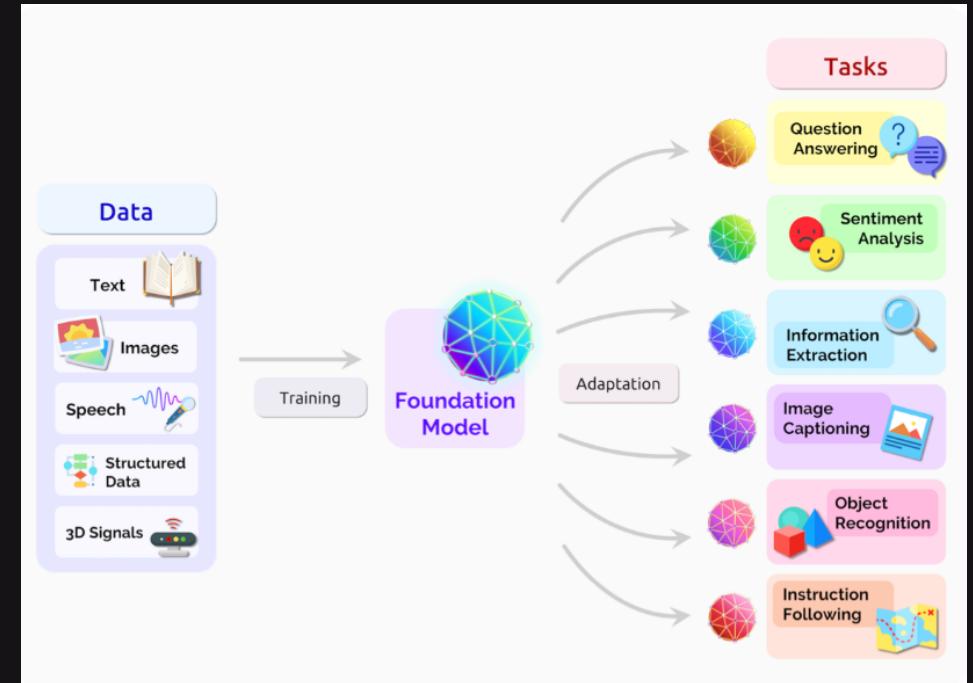


# Understanding Foundation Model



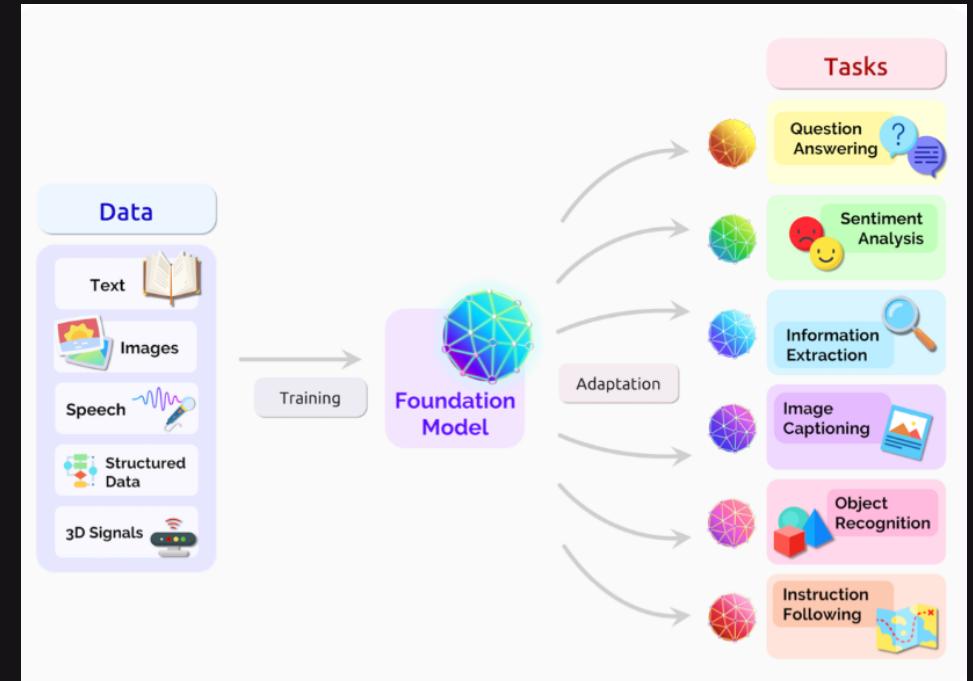
# Why Foundation Model?

- Single model for various use cases



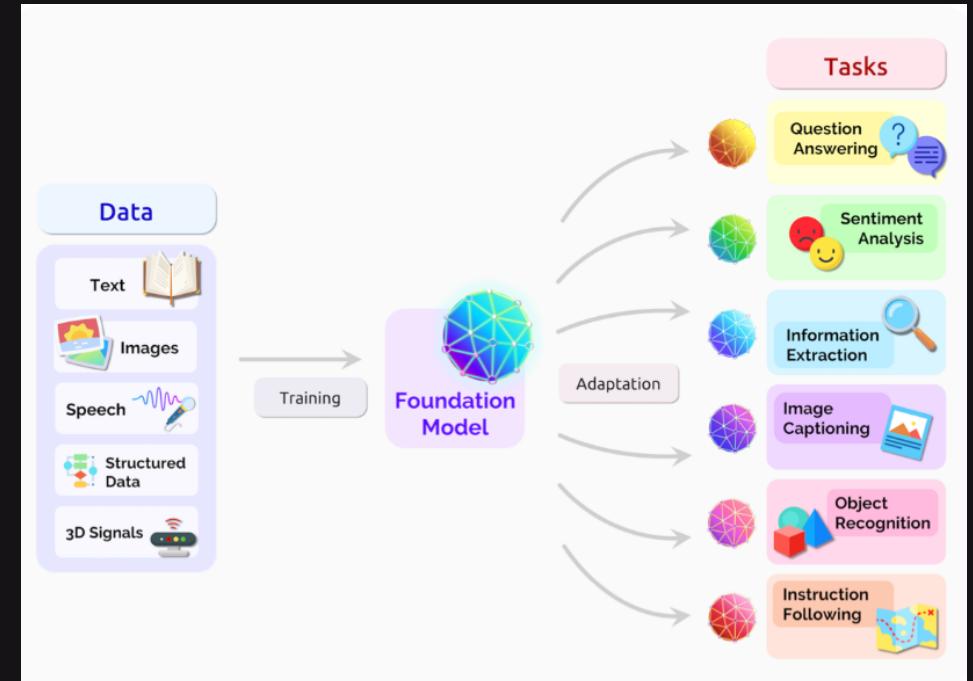
# Why Foundation Model?

- Single model for various use cases
- High-performance model



# Why Foundation Model?

- Single model for various use cases
- High-performance model
- Minimal task specific data



# Example: Voice cloning Application

Before Foundation models

Minimum 10 hours of training data

After Foundation models

Just 3 minutes of training data

# Different types of Foundation Models

Depending on the class of datasets, foundation models can be classified into 2 types:

Unimodal Foundation models

Multimodal Foundation models

# Unimodal Foundation Models

Unimodal Foundation models

Deals with one class of dataset

Multimodal Foundation models

# Examples of Unimodal Foundation Models



GPT-3



PaLM 2



Falcon LLM

# Examples of Unimodal Foundation Models

Diffusion Models



# Multimodal Foundation Models

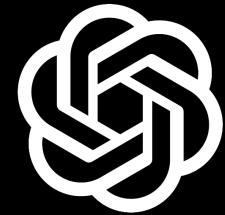
## Unimodal Foundation models

Deals with one class of dataset

## Multimodal Foundation models

Deals with more than one class of datasets

# Examples of Multimodal Foundation Models



GPT-4

Stable Diffusion



DALL-E 3



# Examples of Multimodal Foundation Models

AudioGen

AudioCraft

# Thank You

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