Why Different Perspectives

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Contents:

- ☐ 9.1. What is Machine Learning
- ☐ 9.2. History of Machine Learning
- ☐ 9.3. Why Different Perspectives
- ☐ 9.4. Three Perspectives on Machine Learning
- ☐ 9.5. Applications and Terminologies

Difficulty in Understanding Machine Learning 理解机器学习的难点

☐ Which algorithm should choose **应该选择哪种算法**

- ■ Suppose we have an application that machine learning might be good for, so we need an appropriate algorithm for learning from data.
  假设我们有一个应用程序，机器学习会有帮助，因此需要一个适当的从数据中学习的算法。

- ■ The problem we faced is how to choose one of machine learning algorithms.
  我们面临的问题是如何选择一个机器学习算法。

☐ How many learning algorithms **有多少种算法**

- ■ So many algorithms for machine learning.
  机器学习的算法如此之多。

- ■ Literally thousands available, and hundreds more published each year.
  大概有数千种，每年又会发表数百种。

Difficulty in Understanding Machine Learning 理解机器学习的难点

- ☐ What is the difficulty **难点是什么**

  - ■ Without a category of machine learning, how to determine which algorithm could be used?

    没有机器学习的分类法，如何确定哪种算法适用？

  - ■ The categorization relates our perspective on machine leaning.

    这种分类关系到我们观察机器学习的视点。

- ☐ Is one perspective enough **一个视点够吗**

  - ■ To outlook on most of machine learning algorithms, one perspective is so hard.
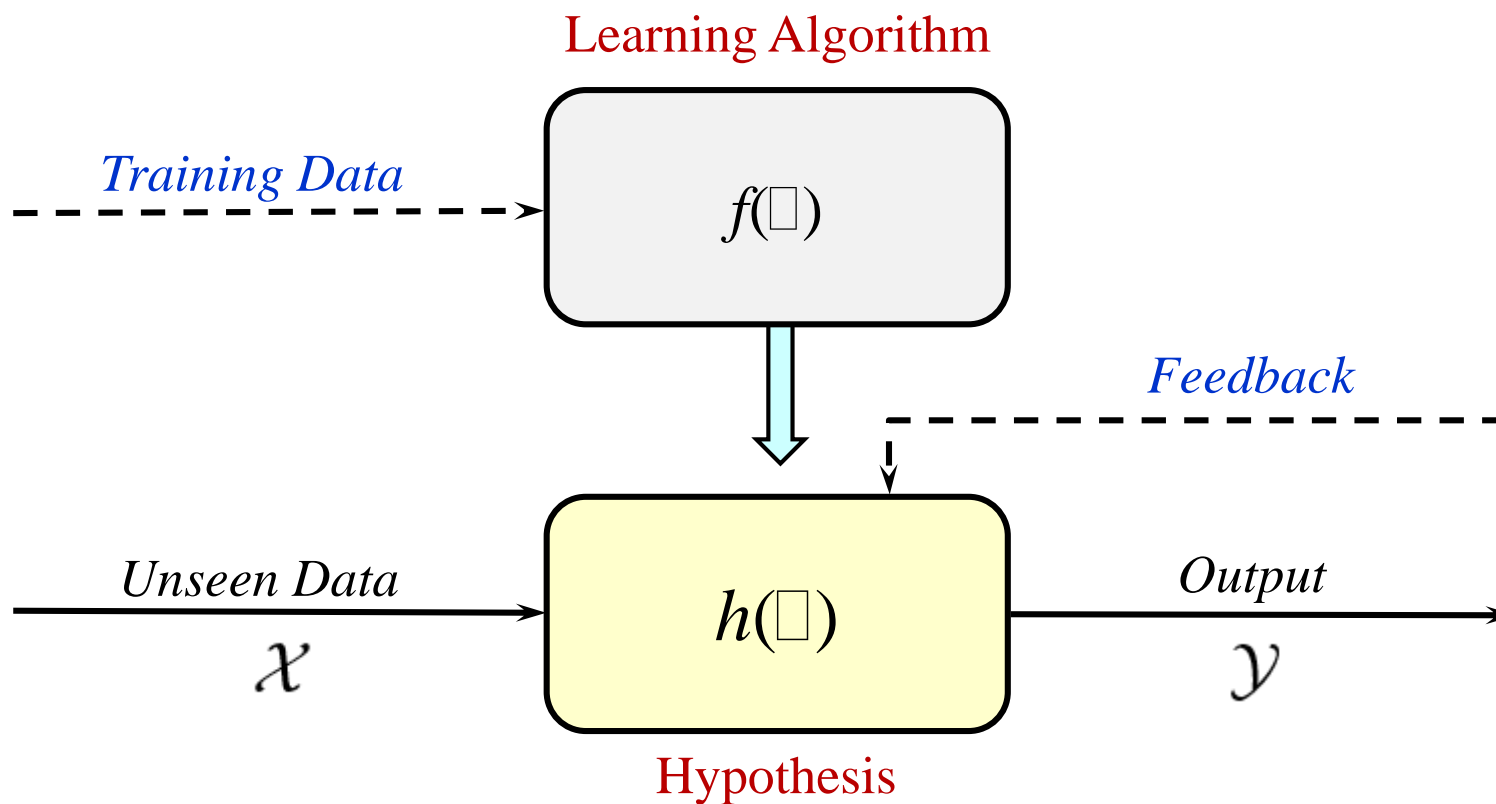
    要了解大多数机器学习算法，仅有一个视点是不够的。

  - ■ We should look from multiple perspectives to have a full view of machine learning.
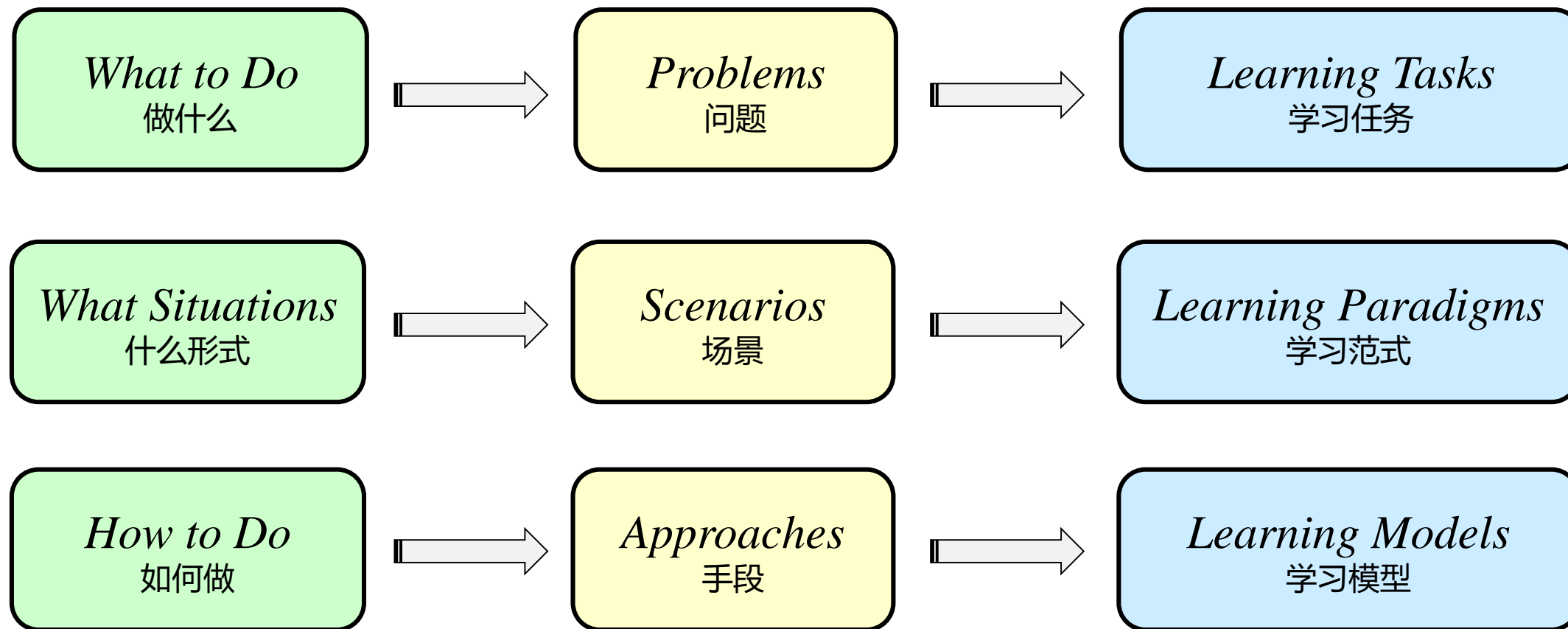
    我们应该从多个视点来观察，使之对机器学习有一个完整的把握。

How Machine Learning Works 机器学习如何工作

☐ It uses experience or interacts with environment to improve performance, or makes accurate predictions.

使用经验或与环境交互来改善性能，或做出精确预测。

Learning Algorithm

Training Data

$f(\square)$

Feedback

Unseen Data

$h(\square)$

Output

$\mathcal{X}$

$\mathcal{Y}$

Hypothesis

Why Three Perspectives 为什么有三个视点

What to Do 做什么 →	**Problems** 问题 →	**Learning Tasks** 学习任务
What Situations 什么形式 →	**Scenarios** 场景 →	**Learning Paradigms** 学习范式
How to Do 如何做 →	**Approaches** 手段 →	**Learning Models** 学习模型

Definition of the Three Perspectives 三个视点的定义

Types 类型	Description 描述
Learning Tasks 学习任务	Denoting the general **problems** that can be solved by machine learning. 表示可以用机器学习解决的基本**问题**。
Learning Paradigms 学习范式	Denoting the **typical scenarios** that are happened in machine learning. 表示机器学习中发生的**典型场景**。
Learning Models 学习模型	Denoting the **approaches** that can handle to fulfil a learning task. 表示可以处理完成一个学习任务的**方法**。

Thank you for your attention !

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