

No.9

Introduction to Machine Learning and Deep Learning

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This tutorial introduces key paradigms in machine learning—offline and online learning—using simple, intuitive examples. Following these paradigms, we provide mathematical explanations of fundamental machine learning concepts, including generalization and the trade-off between exploration and exploitation. While some theoretical discussion is included, the emphasis is on clarity and intuition rather than deep technical detail. In the latter part of the talk, we highlight recent trends in deep learning, focusing on diffusion models for generative tasks and large language models for natural language processing, and related topics. The goal is to provide a broad, accessible overview of both classical and modern approaches to machine learning.