

Mathematical Methods for Machine Learning

Phương Pháp Toán Cho Học Máy

NGUYỄN QUẢN BÁ HỒNG

UMT – University of Management & Technology of HCMC

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1 Preliminaries

[Tie20] VŨ HỮU TIỆP. *Machine Learning Cơ Bản*.

[DF023] MARC PETER DEISENROTH, A. ALDO FAISAL, CHENG SOON ONG. *Mathematics for Machine Learning*. 2023.

Audience & Goal

Target Audience. Mainly: Engineering- & CS undergraduate students.

Note: Mathematics undergraduate students, especially academic/research-oriented, need much more rigorously theoretical mathematical foundations for ML.

Goal

Learn enough mathematics to be able to balance our comprehension in both mathematical- & technical (engineering) aspects of Machine Learning: Adjust “suitable” coefficients $\alpha, \beta, \gamma \in (0, 1)$ s.t. $\alpha + \beta + \gamma = 1$ &

$$\text{Maximize Goal(What, How, Why)} := \alpha \text{What} + \beta \text{How} + \gamma \text{Why}. \quad (1)$$

where the functional $\text{Goal(What, How, Why)}$ depends on your target job(s) & purpose(s).

Prerequisites

Linear Algebra

Probability

Statistics