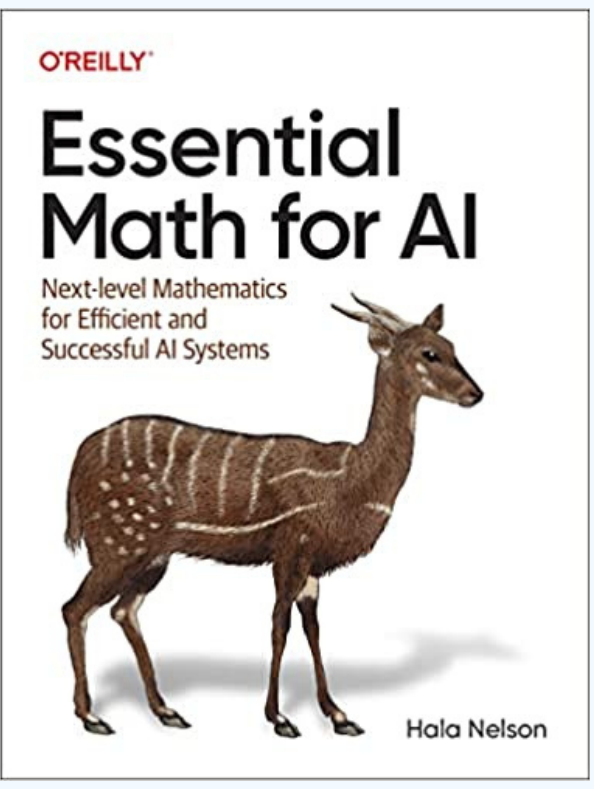
Essential Math for AI



Intelligence

Perceiving
Vision
Hearing
Measuring

Understanding

Controlling
Robotics

Becoming Aware

Reasoning
Logical
Causal
Ethical

Memory
Database

Communicating
Language
Reading
Writing
Talking

Imagining
Simulating
Generating

Transferring knowledge

Empathizing

Creating Tools
Automating

Improving
Learning
Reinforcing

Reproducing

Mathematical Models for Intelligence

Input
Any type of data

→ **Numbers Vectors Matrices Tensors**

→ **Reduce Dimensions**

→ **Some Math Function**
simple or complex

→ **Output**
Any type of data

Linear Combinations Compositions

Test
Improve

Maximize Reward

Deterministic Models

Training Function
Minimize Loss

Probabilistic Models

Joint Probability Distribution
Maximize Likelihood