Core AI

A concise foundation of Artificial Intelligence

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Contents

Chapter 1

Introduction

This small book explains the stages required to become a strong artificial intelligence developer. This book is based on 17 stages, where each stage has its own dedicated book. This book serves as the index and foundation for all other books.

Chapter 2

ALL stages

stage	Title
01	Tensor Mathematics Lessons
02	ALA (Applied Linear Algebra in coder)
03	ABM (Autograd and Backprop Mechanics)
04	OC (Optimization in code)
05	LFTL (Loss Functions and Training Loop)
06	SQL Lessons (PostgreSQL)
07	NoSQL Lessons (MongoDB)
08	Object Storage Lessons (MinIO)
09	Vector Database Lessons (Qdrant)
10	Linear Regression
11	Logistic Regression
12	Perceptron
13	MLP (Feed-Forward Network)
14	RNN (Recurrent Neural Network)
15	LSTM (Long Short-Term Memory)
16	Transformer
17	LLM (Large Language Model)

Table 2.1: Core AI - 17 stages

Chapter 3

Tensor Mathematics Lessons

text..

Code	Lesson
T00	Foundations of Scalars and Basic Tensor Concepts
T01	Vector Definitions and Operations
T02	Matrix Structures and Transformations
T03	Tensor Expansion Rules and Dimensionality
T04	Advanced Matrix - Tensor Interactions
T05	Differential Tensor Calculus
T06	Optimization Theory Foundations
T07	Statistical Tensor Applications
T08	Neural Transformation Mathematics

Table 3.1: Tensor (T00 - T08)

Chapter 4

ALA (Applied Linear Algebra in Code)

text..

Code	Lesson
ALA00	Tensor Operations in Code
ALA01	Vector Dot and Norm Computation
ALA02	Matrix Multiplication (matmul - mm)
ALA03	Outer vs Inner Product
ALA04	Broadcasting Rules and Mechanics
ALA05	Shape Reasoning and Dimension Flow
ALA06	Basis, span and projection (Applied)

Table 4.1: ALA (ALA00 - ALA06)

Chapter 5

ABM (Autograd and Backprop Mechanics)

text..

Chapter 6

OC (Optimization in Code)

text..

Chapter 7

LFTL (Loss Functions and Training Loop)

text..

Chapter 8

SQL Lessons (PostgreSQL)

text..

Chapter 9

NoSQL Lessons (MongoDB)

text..

Chapter 10

Object Storage Lessons (MinIO)

text..

Chapter 11

Vector Database Lessons (Qdrant)

text..

Chapter 12

Linear Regression

text..

Chapter 13

Logistic Regression

text..

Chapter 14

Perceptron

text..

Chapter 15

MLP (Feed-Forward Network)

text..

Chapter 16

RNN (Recurrent Neural Network)

text..

Chapter 17

LSTM (Long Short-Term Memory)

text..

Chapter 18

Transformer

text..

Chapter 19

LLM (Large Language Model)

text..