Table of Contents

Part I: Brains & Inspiration

Chapter 1: Introduction to Neuroscience ↔ AI ..... ###
Chapter 2: Neuroscience Foundations ..... ###
Chapter 3: Spatial Navigation ..... ###
Chapter 4: Perception Pipeline ..... ###

Part II: Brains Meet Math & Data

Chapter 5: Brain Networks ..... ###
Chapter 6: Neurostimulation ..... ###
Chapter 7: Information Theory ..... ###
Chapter 8: Data Science Pipeline ..... ###

Part III: Learning Machines

Chapter 9: Machine Learning Foundations ..... ###
Chapter 10: Deep Learning ..... ###
Chapter 11: Sequence Models ..... ###

Part IV: Frontier Models

Chapter 12: Large Language Models ..... ###
Chapter 13: Multimodal Models ..... ###

Part V: Ethics & Futures

Chapter 15: Ethical AI ..... ###
Chapter 16: Future Directions ..... ###

Part VI: Advanced Applications

Chapter 17: BCI & Human-AI Interfaces ..... ###
Chapter 18: Neuromorphic Computing ..... ###
Chapter 19: Cognitive Neuroscience & Deep Learning ..... ###

Chapter 20: Case Studies ..... ###
Chapter 21: AI for Neuroscience Discovery ..... ###
Chapter 22: Embodied AI & Robotics ..... ###
Chapter 24: Quantum Computing in NeuroAI ..... ###
Chapter 23: Lifelong Learning ..... ###

Part VII: Appendices

Mathematical & Python Refresher ..... ###
Dataset Catalogue ..... ###
Colab Setup Guide ..... ###