Part I

Applied Math and Machine Learning Basics

This part of the book introduces the basic mathematical concepts needed to understand deep learning. We begin with general ideas from applied math that enable us to define functions of many variables, find the highest and lowest points on these functions, and quantify degrees of belief.

Next, we describe the fundamental goals of machine learning. We describe how to accomplish these goals by specifying a model that represents certain beliefs, designing a cost function that measures how well those beliefs correspond with reality, and using a training algorithm to minimize that cost function.

This elementary framework is the basis for a broad variety of machine learning algorithms, including approaches to machine learning that are not deep. In the subsequent parts of the book, we develop deep learning algorithms within this framework.