# *preface*

Welcome to *Machine Learning Algorithms in Depth*! The idea of writing this book came to me during my graduate school years. At the time, I was switching majors from wireless communications to machine learning and found that one constant during this transition was my fascination with algorithms. I wanted to study this subject in depth and really understand how to derive, implement, and analyze algorithms from the first principles. I was fortunate to have found a research home in the Sensing, Learning, and Inference group at MIT CSAIL, where I was exposed to a wide variety of machine learning applications centered on Bayesian inference. At the same time, the field of deep learning was rapidly evolving, and I found myself training and experimenting with a variety of neural network models for computer vision and natural language processing.

I've always been fascinated with the complementary strengths of probabilistic graphical models and deep learning models, and pondered ways in which the two can be combined. Throughout my graduate school journey, I was exposed to a variety of applications and developed a library of algorithms I implemented from scratch. I read many machine learning texts and was a technical editor for others, which lead me to finding a gap in the existing literature: a from-scratch approach to machine learning algorithms. This was my "aha!" moment, and it fueled my dream of writing a book. *Machine Learning Algorithms in Depth* takes the reader on a journey from mathematical derivation to software implementation of some of the most intriguing algorithms in ML. My goal in writing this book is to distill the science of ML and present it in a way that will convey intuition and inspire the reader to self-learn, innovate, and advance the field. Thank you for your interest, and welcome to the world of ML algorithms!