Linear Algebra and Learning from Data. *By Gilbert Strang.* Wellesley-Cambridge Press, 2019. $95.00. xiv+432 pp., hardcover. ISBN 978-0-692196-38-0.

Imagine the following scenario: Like many other universities worldwide, your university has created a new Master's program in data science and you are now considering how to design a one-semester introductory course in mathematical fundamentals for a quantitatively oriented but otherwise heterogeneous group of students. As a mathematician, you ask yourself what data science exactly is, what kind of mathematics plays a role, what is most important when there is not enough time, and how you should set up such a course.

It was exactly this problem that I faced a year ago and developed my own ideas, which focused on singular value decomposition and other topics of numerical linear algebra with small excursions to calculus for neuronal networks.

Now, however, this problem is completely and convincingly solved by Gilbert Strang in his most recent book on linear algebra and learning from data. Most readers will be familiar with Gilbert Strang through his many successful efforts in teaching mathematical foundations in several books and other media, in particular linear algebra. In this book, the grandmaster goes beyond linear algebra (Chapter I) and imparts further basics, such as dealing with large and special matrices (Chapters II and IV), low-rank approximation (Chapter III), basics of statistics and optimization (Chapters V and VI), and an introduction to neural networks (Chapter VII). The writing style is dense but catchy. The reader is addressed directly, almost like in the video lectures by the author, which can be found on the internet. Lecturers will enjoy the book because it presents exactly the right topics in an excellent and coherent way, and because there is a lot of background information and numerous important references to the literature and to links on the internet. I envylessly acknowledge that this book is considerably better and more comprehensive than my own script that I wrote for my course a year ago. Although the book contains rigorous proofs for numerous statements within the text, these are not highlighted in the layout. Instead of the usual keyword "theorem," boxes serve as a structuring element containing the important statements and remarks. For each chapter there is a set of exercises and smaller software projects. The book is ideally suited as a basis for a course on mathematical basics for data science and machine learning. It is advisable to move selected chapters to a subsequent course because the wealth of material conveyed in this book is large.

I recommend this excellent book without hesitation as a course foundation for all teachers and will use it in the next semester as an accompanying material for my own course. The only complaint I can make about the book is that it hasn't been published earlier.

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