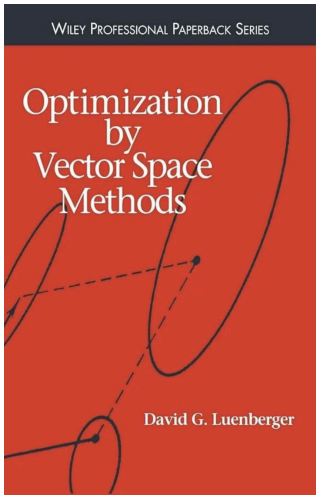
The ~~Western~~ Gappy Canon

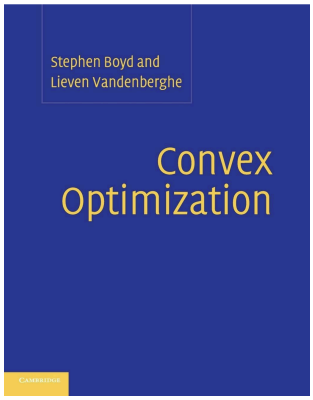
Here are some semi-random book recommendations I have given on X, both in public and private messages, with a short explanation of why. They are highly idiosyncratic. I spent time with these books.

Optimization, Approximation and Basic Analysis



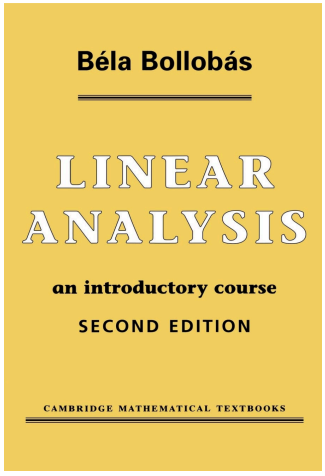
D. Luenberger, *Optimization by Vector Space Methods* (hardcopy, kindle [much cheaper])

This was an outgrowth of Luenberger's PhD thesis. It is a very friendly introduction to basic concepts of functional analysis, and a treatment of optimization in abstract spaces. A masterful example of great exposition, and extremely useful.

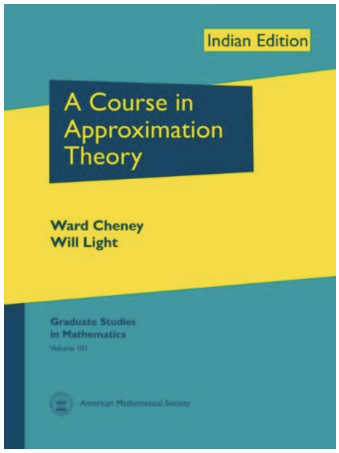


S. Boyd and L. Vandenberghe, Convex Optimization (hardcopy/kindle, free copy)

Friendly, free, complete. It focuses on the theory of optimization, in a discursive but rigorous way. Can be read back to back for self-instruction. Very good reference.

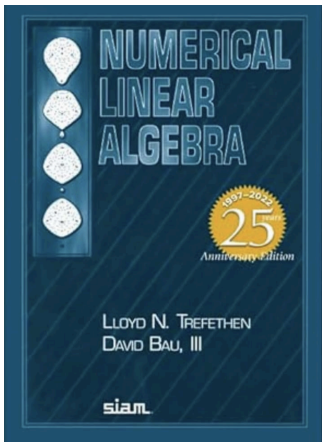


B. Bollobas, Linear Analysis, 2nd ed. (hardcopy)
Undergraduate course material on functional analysis covering all the bases for the working analyst. The easiest treatment I know of, written by another master expositor.

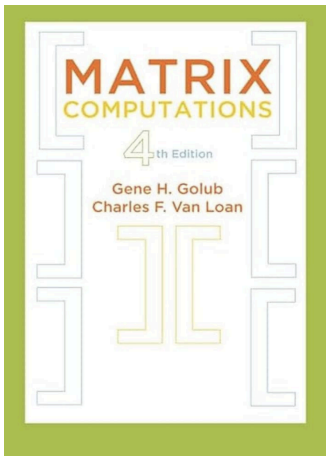


E. W. Cheney, W. Light, A Course In Approximation Theory (Hardcopy)
You need to know approximation theory, especially in the era of overcomplete models. This is a book about the theory of AT. It will open your mind to new concepts.

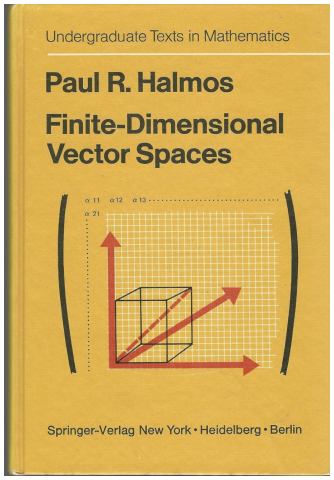
Linear Algebra



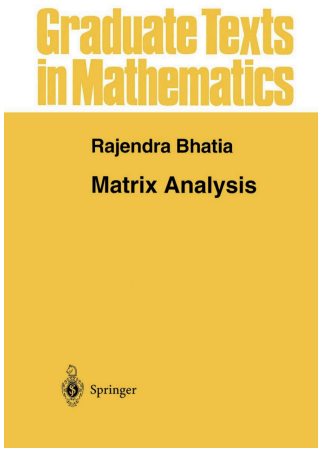
L. N. Trefethen, Bau, Numerical Linear Algebra (paperback)
The best way to learn linear algebra is to learn numerical linear algebra. Great introduction to matrix decompositions and computation of projections.



G. Golub, C. Van Loan, Matrix Computations, 4th ed. (hard/paper/soft)
The bible of numerical linear algebra. So clear and useful. Mostly useful as a reference

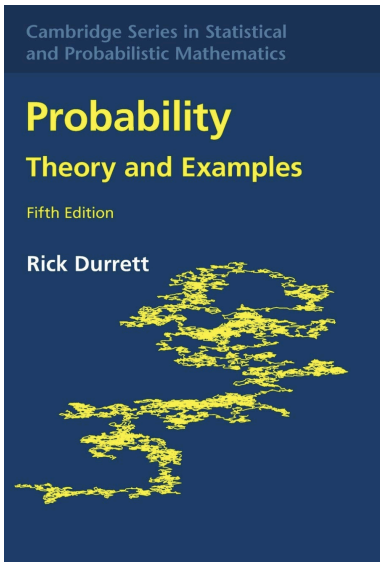


P. R. Halmos, Finite Dimensional Vector Spaces (hardcopy)
How to get intuition about linear algebra. Undergraduate-level but not dumb

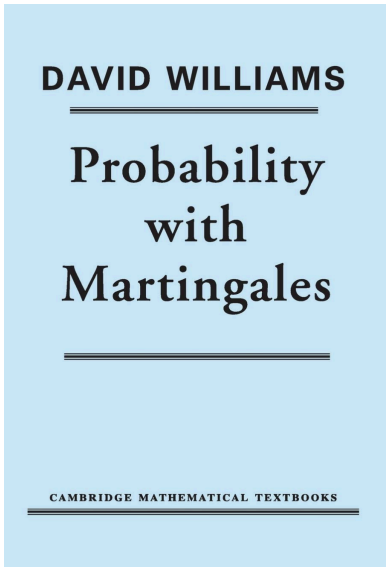


R. Bhatia, Matrix Analysis (hard/paper)
This is in equal parts linear algebra and functional analysis in finite spaces. It is advanced and synthetic. If you know the contents of this book, you know linear algebra.

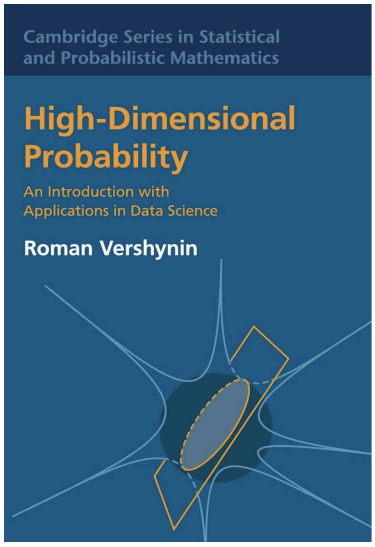
Probability



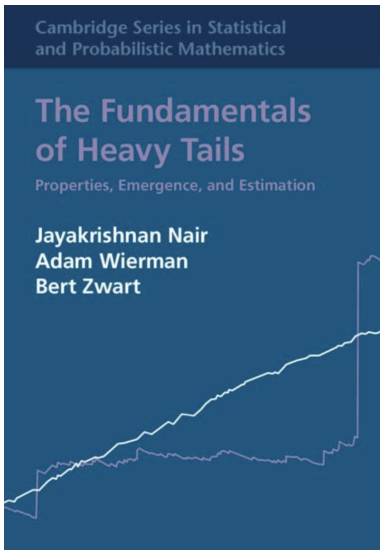
R. Durrett, Probability, 5th ed. (hard/softcover)
I learned graduate probability on this book. Not easy. It has thoroughly corrected typos. Self-contained. Interesting examples.



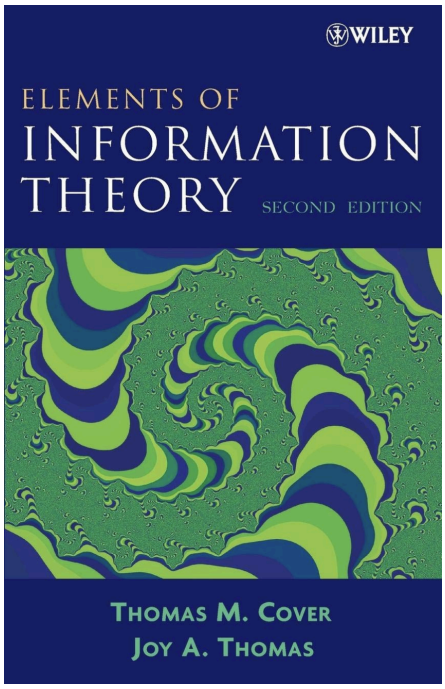
D. Williams, Probability with Martingales (softcover/ebook)
Breezy reading, the shortest book to quickly learn measure-theoretic probability. It's funny, it's enlightening. It changed my life because it made me fall in love with probability.



R. Vershynin, High-Dimensional Probability (hardcover/ebook, free softcopy)
Covers concepts that are relevant to machine learning, PAC bounds, concentration results, geometry of convex bodies/norms in high dimensions. Very well-written and friendly.



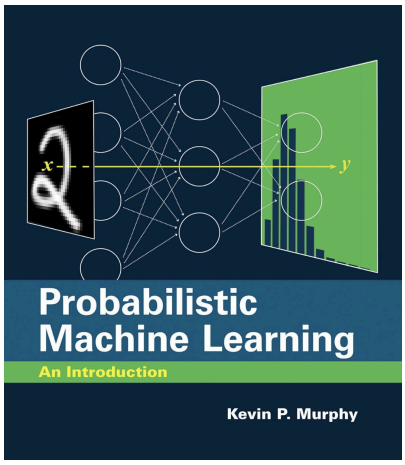
J. Nair, A. Wierman, B. Zwart, The Fundamentals of Heavy (hardcover/kindle)
This is the best short introduction to heavy-tailed phenomena. Relevant to finance people.



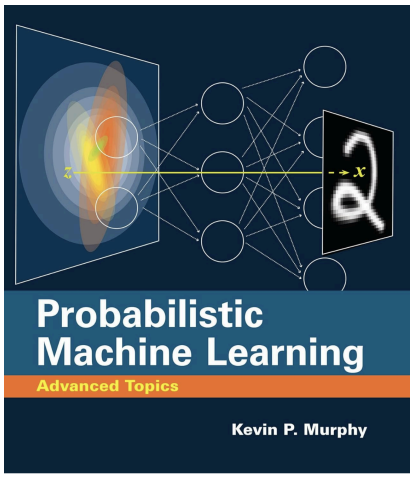
T. Cover, J. Thomas, Elements of Information Theory, 2nd ed. (hardcover/paperback/kindle)

A classic of exposition. Not really probability, I know. I use it mostly as a reference.

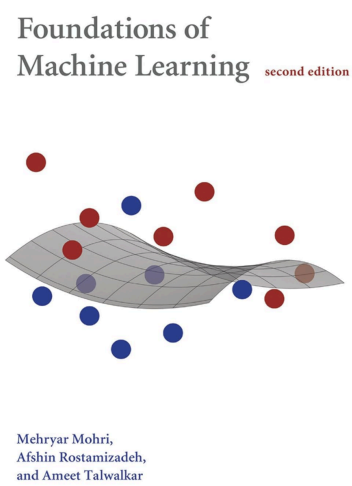
Machine Learning/Statistics



K. P. Murphy, Probabilistic Machine Learning: an Introduction (Kindle/hardcover)

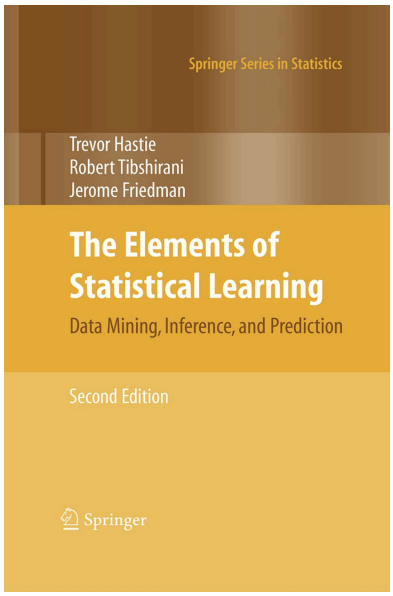


K. P. Murphy, Probabilistic Machine Learning: Advanced Topics (Kindle/hardcover)
These two books are some of the best theoretical (but with an eye to applications) intro to ML.



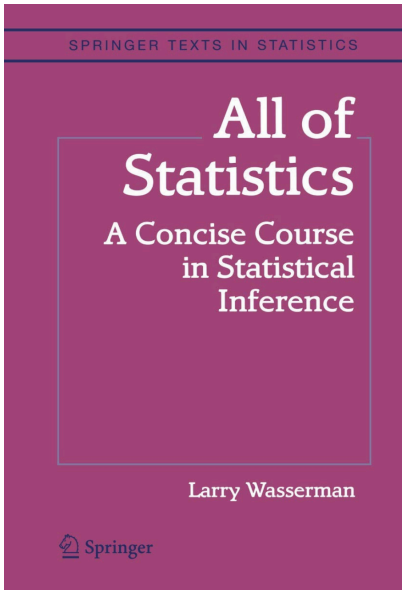
M. Mohri, A. Rostamizadeh, A. Talwalkar, Foundations of Machine Learning, 2nd ed. (Kindle/hardcover)

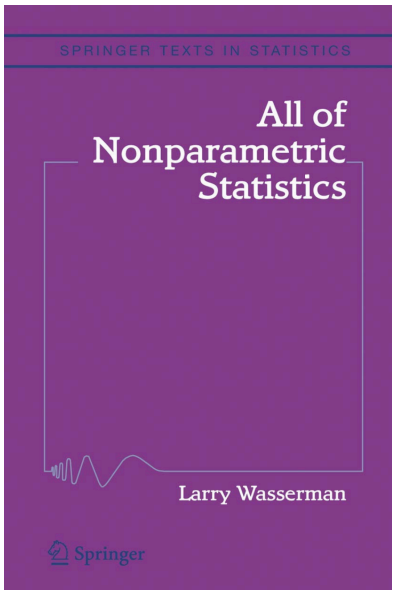
I love this book because it is short, selective, elegant. It makes you understand the concepts behind ML.



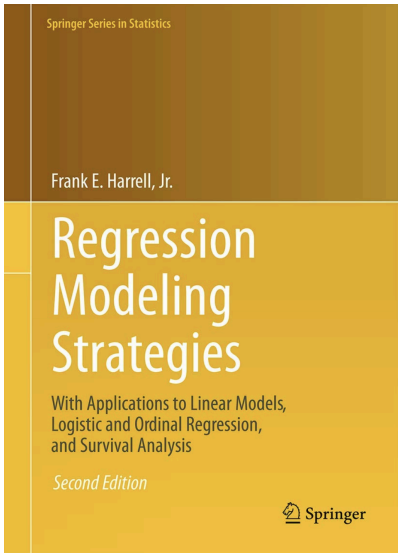
T. Hastie, R. Tibshirani, J. Friedman, The Elements of Statistical Learning, 2nd ed (hard/softcover/kindle, free copy)

Dated, with a poor treatment of neural networks, and questionable ideas about model selection. But unsupervised learning, PCA, ensemble methods are still masterfully explained.



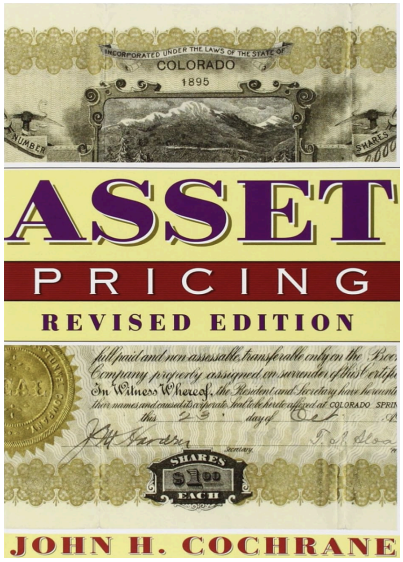


L. Wasserman, All of Statistics (hardcopy/kindle), All Nonparametric Statistics (hardcopy/kindle)

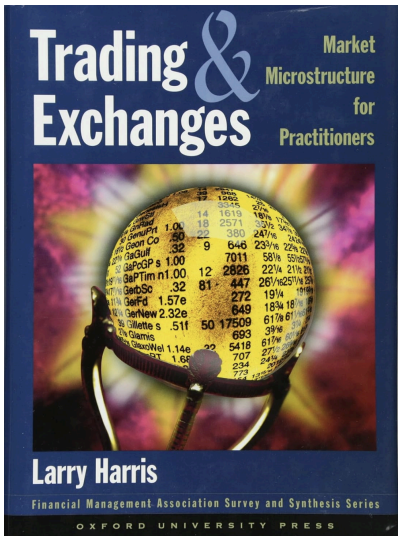


F. E. Harrell Jr., Regression Modeling Strategies (hard/softcover/etextbook)

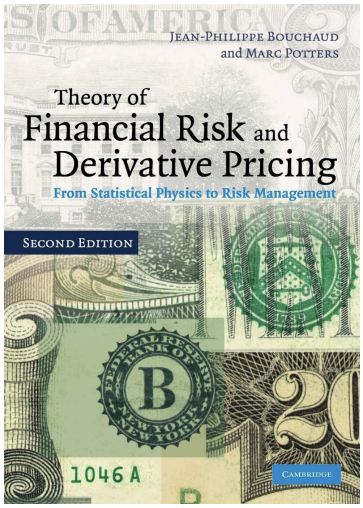
Finance



J. Cochrane, Asset Pricing (hardcover/kindle)
It has a very unique style: Cochrane uses "I" and "you" a lot. He focuses on concepts, and explains factor models, empirical pricing and Generalized Method of Methods like no one else.

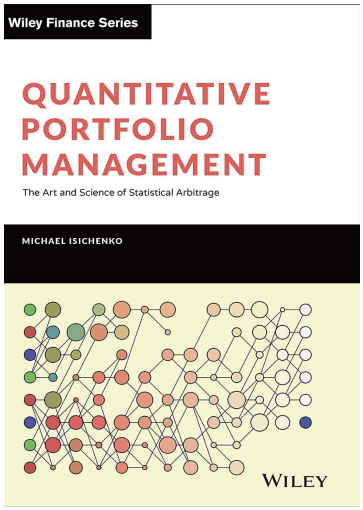


L. Harris, Trading and Exchanges (hardcover/paperback/kindle)
Overlong but essential treatment of the institutional details of market structure. A bit dated.



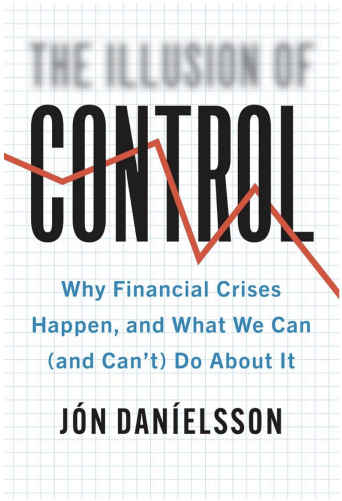
J.P. Bouchaud, M. Potters, Theory of Financial Risk and Derivative Pricing (hard/soft/kindle)

Another old book, written when Bouchaud was relatively new to the game. It's full of ideas and has aged well

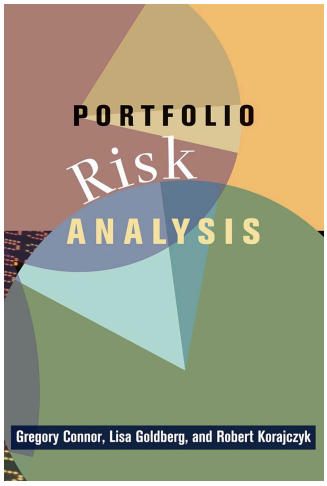


M. Isichenko, Quantitative Portfolio Management (hard/kindle)

This is the best available book on quantitative investing written by an actual practitioner. It's scattershot and in parts generic, but still worth reading.



J. Danielsson, The Illusion of Control (various formats)
The best (most intelligent, well written) book on broad, macro-level risk management available. Very accessible, just a bit too long.



G. Connor, L. R. Goldberg, R. A. Korajczyk, Portfolio Risk Analysis (hardcover/etextbook)
Connor worked as a consultant to Barra, and Goldberg worked at Barra for many years. This book is clear and a good introduction to factor models