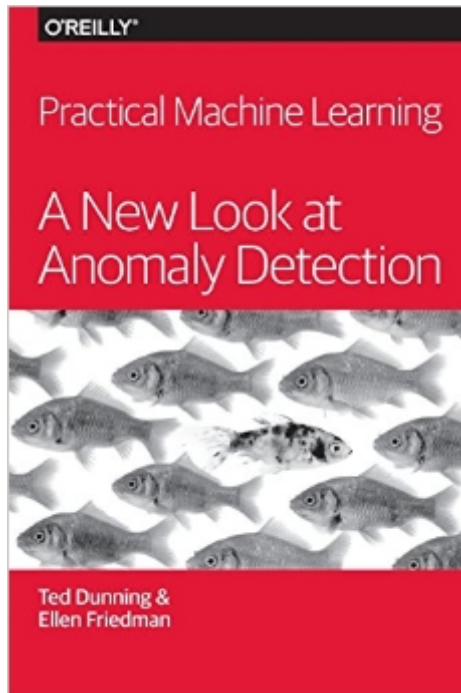


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# Practical Machine Learning: A New Look At Anomaly Detection



## Synopsis

Finding Data Anomalies You Didn't Know to Look For Anomaly detection is the detective work of machine learning: finding the unusual, catching the fraud, discovering strange activity in large and complex datasets. But, unlike Sherlock Holmes, you may not know what the puzzle is, much less what you're looking for. This O'Reilly report uses practical examples to explain how the underlying concepts of anomaly detection work. From banking security to natural sciences, medicine, and marketing, anomaly detection has many useful applications in this age of big data. And the search for anomalies will intensify once the Internet of Things spawns even more new types of data. The concepts described in this report will help you tackle anomaly detection in your own project.

Use probabilistic models to predict what's normal and contrast that to what you observe  
Set an adaptive threshold to determine which data falls outside of the normal range, using the t-digest algorithm  
Establish normal fluctuations in complex systems and signals (such as an EKG) with a more adaptive probabilistic model  
Use historical data to discover anomalies in sporadic event streams, such as web traffic  
Learn how to use deviations in expected behavior to trigger fraud alerts

## Book Information

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## Customer Reviews

There are a lot of short, introductory texts and review articles out there that are really useful- they introduce you to the fundamental concepts of the field, so that you have a basic understanding and so that you'll know what to look up if you need it. This is not one of those books. The depth of the

"practical machine learning" advice in this book is at the level of gems like "before you can spot an anomaly, you first have to figure out what 'normal' is." (chapter 2) Really? My anomaly detection system will have to know what things AREN'T anomalies? Well thank God I dropped \$18 to find that out. Sure, the book (sort of) introduces some important concepts that could point you toward more information- like self-information, maximum entropy distributions, type I and II errors, and Bayes risk. I say "sort of" because they're not derived, motivated, or explained in any detail. Most importantly, the authors don't use the proper terms for any of them, so you won't even know what to look up for more information. My favorite chapter is the one devoted to the "t-Digest" algorithm, which was developed by one of the authors. You get to spend the entire chapter waiting for the part where they explain the algorithm, what it does, or how it works. Guess what- it's not there! There's literally an entire chapter on an algorithm that never discusses, even qualitatively, what the algorithm is. I honestly have no idea who this book is supposed to be for. The authors bring up Mahout constantly, which you're probably not using if you're new to machine learning. If you aren't a complete novice, though, you'll just be insulted.

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