

Book recommendation:

Information Theory, Inference, and Learning Algorithms

By David J. C. MacKay

As a student, a friend of mine suggested that I should visit David MacKay's course on information theory and learning algorithms. I was enrolled at the department for mathematics, but he promised that the lectures would be worth the bike ride to the physics department. He was absolutely right.

The course was mainly based on "Information Theory, Inference, and Learning Algorithms" and while it is not possible anymore to attend David MacKay's lectures, reading that book is an almost equally good experience.

The book introduces the formal concept of information. In a written message, for example, some words can easily be reconstructed from their context, while others cannot. I am convinced that every reader can finish this sentence, even if I do not type in the last. The concept of information can be used for asking informative questions in ball weighing games, to construct efficient communication systems, to learn structure from data, or to develop compression algorithms. The program "Dasher" allows users to effectively write text by using only a single finger or an eye tracker.

I like that the book presents mathematics not as a collection of existing results, but as something vivid. This allows the reader to become creative, e.g., by inventing new codes, and to thereby develop a deeper understanding of the material. There is no doubt that mathematics is a beautiful language; for me, its beauty is particularly striking when connected to real world problems. Plenty of such examples can be found in the book.

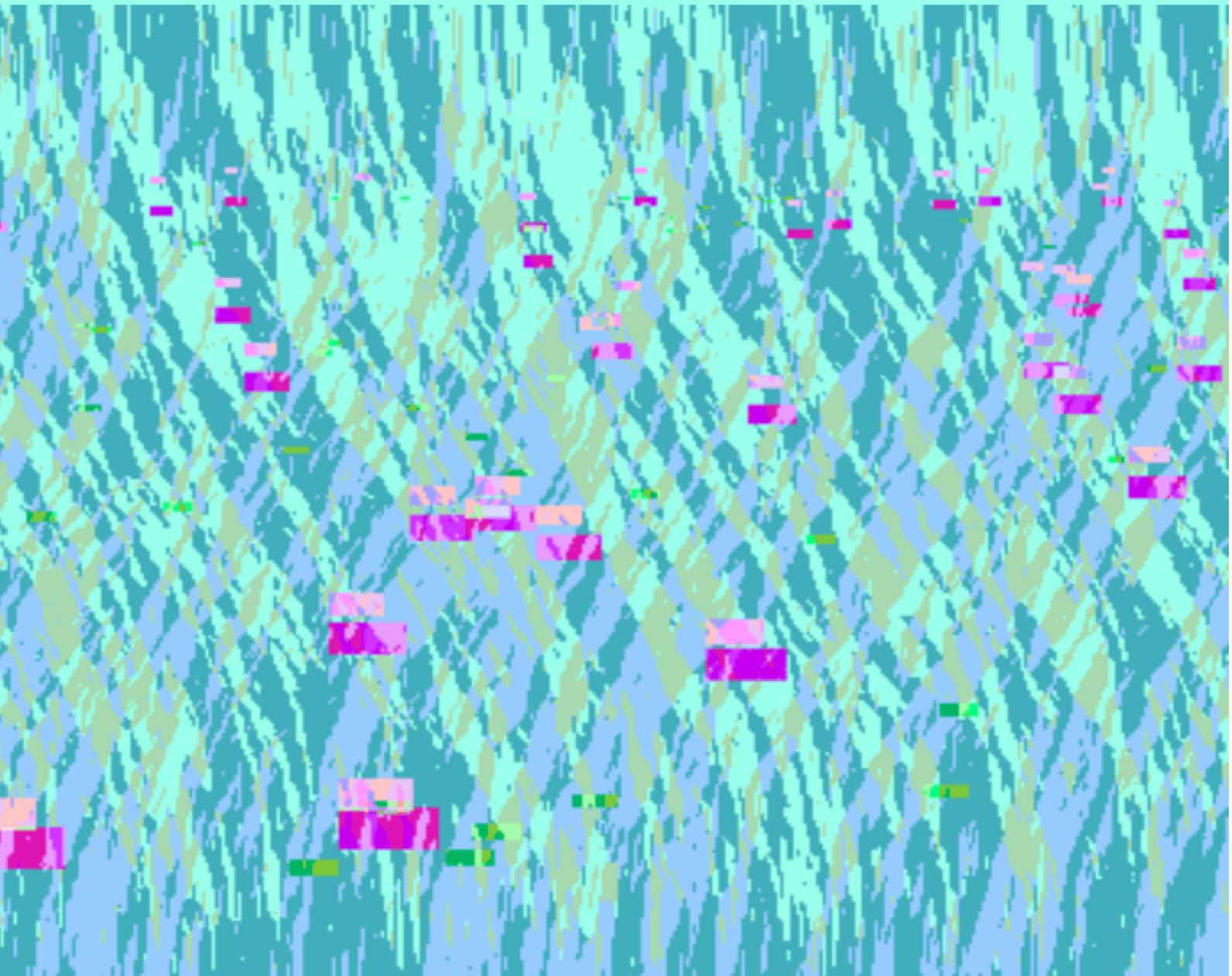
In April 2016, David MacKay died from stomach cancer.
The book is open access and can be downloaded for free:
<http://www.inference.org.uk/mackay/itila/>

Jonas Martin Peters
January 2019



David J.C. MacKay

Information Theory, Inference, and Learning Algorithms



Cambridge University Press, 2003