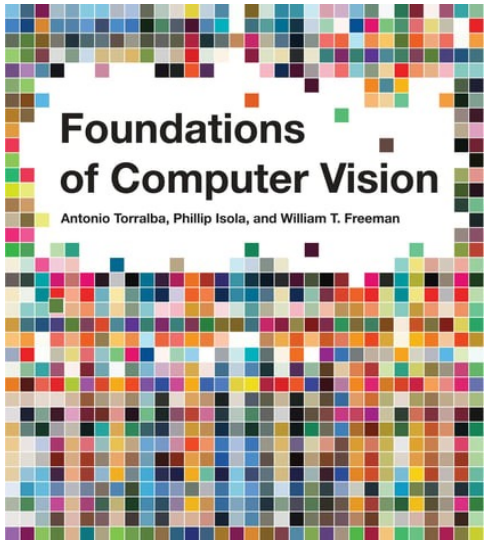

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Foundations of Computer Vision

Torralba, Isola, and Freeman

eTextbook rental
mitpress.ublish.com/catalog

Authoritative, accessible, and up-to-date—a comprehensive introduction that integrates classic computer vision and deep learning

- Covers topics not standard in other texts, including transformers, diffusion models, statistical image models, issues of fairness and ethics, and the research process
- Emphasizes fundamentals and assumes little background knowledge
- Features extensive illustrations, questions, and examples
- Proven in the classroom
- Includes instructor resources

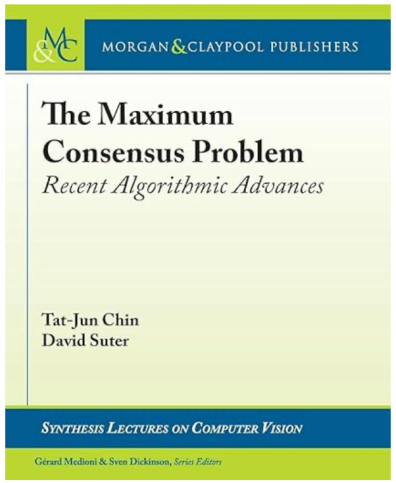
Interested in becoming a reviewer for the MIT Press?Click here.

Disclaimer: I haven't viewed a copy of this book. I have just perused the material available on the links above. The authors are very well known/respected (of course) and the material looks to me to be relatively comprehensive and up to date (as much as could be reasonably expected).

Russell and Norvig http://aima.cs.berkeley.edu/global-index.html

- It's the textbook used (over 4 editions) for the majority of AI courses I am aware of – and of course the Berkeley first year course.
- The first few chapters (1-3; possibly up to 6) are the only ones directly relevant to the course I am giving. Though the overview of computer vision (chapter 27) is also in general relevant.
- The early parts of the book (section I-IV?) are clearly somewhat less affected by the "deep learning era" and so the corresponding chapters of earlier editions should be fine.
- Despite being updated – it is still NOT a deep learning book – it's not really up to giving you a great intro – my guess is it might be useful for this, a little bit, but you really need to get books/resources dedicated (and reasonably current) if you want to quickly get to whgat concepts and software/frameworks people are actually using "today"

Disclaimer: I haven't viewed a copy of the 4th edition of this book.



The Maximum Consensus Problem: Recent Algorithmic Advances (Synthesis Lectures on Computer Vision)

by Tat-Jun Chin (Author), David Suter (Author), Gerard Medioni (Editor)

See all formats and editions

Outlier-contaminated data is a fact of life in computer vision. For computer vision applications to perform reliably and accurately in practical settings, the processing of the input data must be conducted in a robust manner. In this context, the maximum consensus robust criterion plays a critical role by allowing the quantity of interest to be estimated from noisy and outlier-prone visual measurements. The *maximum consensus problem* refers to the problem of optimizing the quantity of interest according to the maximum consensus criterion. This book provides an overview of the algorithms for performing this optimization. The emphasis is on the basic operation or "inner workings" of the algorithms, and on their mathematical characteristics in terms of optimality and efficiency. The applicability of the techniques to common computer vision tasks is also highlighted. By collecting existing techniques in a single article, this book aims to trigger further developments in this theoretically interesting and practically important area.

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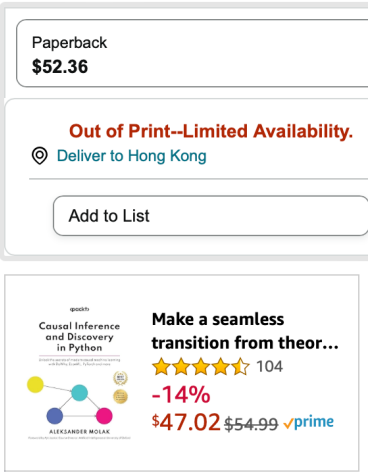
ISBN-10	ISBN-13	Publisher	Publication date	Language
1627052925	978-1627052924	Morgan & Claypool Publishers	February 27, 2017	English

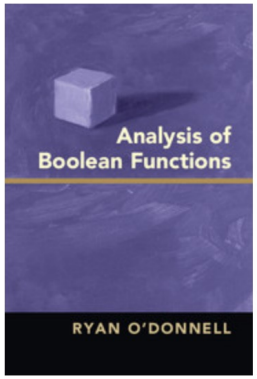


- It is dated (circa 2015), and currently out of print. (We are soon to have a 2nd edition)
- It is relevant for the “second half” of the course I am giving BUT much of what I am giving is actually material that will be be added to the 2nd edition

Disclaimer: obviously I receive a small royalty if you purchase this book as new book (not if you purchase as a second hand one). It is certainly NOT required to have access to this book to understand the material in the course and to successfully complete the course. I actually don’t recommend you even attempt to source a copy unless you are simply keen to ”know more about maxCon”.

Tutorials @ major conferences such as CVPR

- Many of the major conferences have excellent tutorial programs and many of these generously make materials (slides/video) available free.
- CVF (computer vision foundation) covers CVPR, ICCV https://www.thecvf.com
- Of particular relevance to “robust fitting” aspect of this course is the tutorial at CVPR2020 http://cmp.felk.cvut.cz/cvpr2020-ransac-tutorial/
- But you might also be interested in this years’ broad range of topics https://cvpr.thecvf.com/Conferences/2024/Videos



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Ryan O'Donnell, *Carnegie Mellon University, Pennsylvania*

Publisher: Cambridge University Press
Online publication date: July 2014
Print publication year: 2014
Online ISBN: 9781139814782
DOI: https://doi.org/10.1017/CBO9781139814782

Subjects: Algorithmics, Complexity, Computer Algebra, Computational Geometry, Computer Science

- You can actually get a free copy:

https://arxiv.org/abs/2105.10386

ONLY A SMALL portion of this book is actually directly related to this course (essentially the definition of Influence) and even there, this course is not so concerned with mathematical formality/rigour whereas the book IS.

But thoroughly recommended if you have a good maths background – as a useful resource for a wide variety of application to areas of maths, computer science, science, social choice, etc. etc.

Books on Graph and Hypergraph theory

- Sorry I don't know of a good book on hypergraph theory. There are a few research monographs (but they probably aren't that suitable as an intro....)
- Books on graph theory and discrete maths abound. But so does material on these topics in general.
- In short I have no recommendation – I've found a mixture of resorting to wikepedia pages, sometimes online video tutorials (in the west YouTube is a sort of "goto" – for both VERY elementary intros and through to VERY advanced research talks).
- I've also found the SIMONS Institute website/programs hugely interesting and useful (and to a lesser extent similar "organisations" and special meets that put their lectures online). The Simons has themes with "bootcamps" which are VERY useful if you have at least a reasonable maths background and the will to put in some hard hours "getting up to speed".

(Also their "current talk" – see next slide – is probably very relevant given the recent melt-down of Microsoft based systems....)

Lessons from Texas, COVID-19, and the 737 Max: Efficiency vs. Resilience

Richard M. Karp Distinguished Lecture

Moshe Vardi (Rice University)

Thursday, July 18, 2024
4 – 5 p.m. PT
Simons Institute for the Theory of Computing
Calvin Lab auditorium and private livestream for registrants

Registration is required for in-person attendance, access to the livestream, and early access to the recording.

In both computer science and economics, efficiency is a cherished property. The field of algorithms is almost solely focused on their efficiency. The goal of AI research is to increase efficiency by reducing human labor. In economics, the main advantage of the free market is that it promises "economic efficiency." A major lesson from many recent disasters is that both fields have overemphasized efficiency and underemphasized resilience. In this lecture, Moshe Y. Vardi argues that resilience is a more important property than efficiency and discusses how these fields can broaden their focus to make resilience a primary consideration.