

UNIVERSITY OF CAMBRIDGE COMPUTER LABORATORY

M.Phil in Advanced Computer Science

Summary List of Recommended Readings

October 2022

This list is prepared once a year for the benefit of College Librarians and those purchasing course books for M.Phil students. As such it aims to list the most recently available editions of current course books. However, this list should be used in conjunction with syllabus, which gives more information on the suitability of titles for each course. There is also a considerable overlap with the undergraduate reading lists. Journal and conference papers are included in this list for the sake of completeness only. Most will be available online, or in other Cambridge libraries, and it is not expected that volumes of proceedings should be purchased for the sake of a single paper.

The syllabi for M.Phil modules can be found at:

<https://www.cl.cam.ac.uk/teaching/2223/acs.html>

The West Hub Library aims to keep at least one copy of each of the books in this list. Similarly, any journal or conference papers should be available within the University, possibly electronically.

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Abadi, M., et. al. (2016). “TensorFlow: a system for large-scale machine learning”. In *Proceedings of OSDI 2016*.

Aken, D. van (2017). “Automatic database management system tuning through large-scale machine learning”. In *Proceedings of SIGMOD 2017*, pp. 1009-1024.

Anderson, R. (2020). *Security engineering*. Wiley (3rd ed.). ISBN 9781119642787
Available at: <http://www.cl.cam.ac.uk/users/rja14/book.html>

Anderson, T. & Dahlin, M. (2014). *Operating systems: principles and practice*. Recursive Books (2nd ed.).

Ansel, J., et. al. (2014). “OpenTuner: an extensible framework for program autotuning”. In *Proceedings of PACT 2014*, pp. 303-316.

Arbesman, S. (2017). *Overcomplicated: technology at the limits of comprehension*. Penguin. ISBN 9780143131304.

Arkin, R.C. (1998). *Behaviour-based robotics*. MIT Press. ISBN 0262011654.

Arora, S. & Barak, B. *Computational complexity*. Cambridge University Press. ISBN 9780521424264.

Awoodey, S. (2010). *Category theory*. Oxford University Press (2nd ed.).

Bacon, J. & Harris, T. (2003). *Operating systems*. Addison-Wesley (3rd ed.).

- Bishop, C.M. (2006). *Pattern recognition and machine learning*. Springer. ISBN 0387310738. Available at: <https://www.microsoft.com/en-us/research/uploads/prod/2006/01/Bishop-Pattern-Recognition-and-Machine-Learning-2006.pdf>
- Boreskov, A. & Shikin, E. (2014). *Computer graphics: from pixels to programmable graphics hardware*. CRC Press (2nd ed.). ISBN 9781439867303
- Bronstein, M.M., et. al. (2021). *Geometric deep learning: grids, groups graphs, geodesics and gauges*. Unpublished draft available at: <https://arxiv.org/pdf/2104.13478>
- Crole, R.L. (1993). *Categories for types*. Cambridge University Press. ISBN 0521450926.
- Crovella, M. & Krishnamurthy, B. (2006) *Internet measurement: infrastructure, traffic and applications*. Wiley. ISBN 9780470014615.
- Day, J. (2007). *Patterns in network architecture: a return to fundamentals*. Prentice Hall.
- Dalibard, V., Schaarschmidt, M. & Yoneki, E. (2017). “BOAT: Building auto-tuners with structured Bayesian optimization”. In *Proceedings of WWW 2017*, pp. 479-488.
- Dean, J., et. al. (2012). “Large scale distributed deep networks”. In *Proceedings of Neural information processing systems 2012*.
- Deisenroth, M.P., Faisal, A.A. & Ong, C.S. (2020). *Mathematics for machine learning*. Cambridge University Press. ISBN 9781108455145. Available at: <https://mml-book.github.io/book/mml-book.pdf>
- Ebbinghaus, H.-D. & Flum, J. (1999). *Finite model theory*. Springer (2nd ed.). ISBN 3540287876.
- Eubanks, V. (2019). *Automating inequality: how high-tech tools profile, police, and punish the poor*. Picador. ISBN 9781250215789.
- Fantoni, I. & Lozano, R. (2002). *Non-linear control for underactuated meachanical systems*. Springer. ISBN 1852334231.
- Frank, R.H. (2008). *The economic naturalist: why economics explains almost everything*. EBury Publishing. ISBN 9780753513385
- Gollmann, D. (2010). *Computer security*. Wiley (3rd ed.). ISBN 9780470741153.
- Goodfellow, I., Bengio, Y. & Courville, A. (2016). *Deep learning*. MIT Press. ISBN 9780262035613. Available at: <http://www.deeplearningbook.org/>
- Gradel, E., et. al. (2012). *Finite model theory and its applications*. Springer. ISBN 9783540004288.
- Gregg, B. & Mauro, J. (2011). *DTrace: dynamic tracing in Oracle Solaris, Mac OS X and FreeBSD*. Prentice Hall. ISBN 9780132091510.
- Gregg, B. (2021). *Systems performance: enterprise and the cloud*. Addison-Wesley (2nd ed.). ISBN 9780136820154.
- Hainich, R.R. & Bimber, O. (2017) *Displays: fundamentals and applications*. CRC Press (2nd ed.). ISBN 9781498765688.
- Hamilton, W.L. (2020). *Graph representation learning*. Morgan & Claypool. ISBN 9781681739632.

- Hennessy, J. & Patterson, D. (2019) *Computer architecture: a quantitative approach*. Elsevier (6th ed.). ISBN 9780128119051.
- Herlihy, M., et. al. (2020). *The art of multiprocessor programming*. Morgan Kaufmann (2nd ed.). ISBN 9780124159501.
- Heunen, C. & Vicary, J. (2019). *Categories for quantum theory: an introduction*. Oxford University Press. ISBN 9780198739616.
- Hildebrandt, M. (2020). *Law for computer scientists*. Oxford University Press.
- Immerman, N. (1999). *Descriptive complexity*. Springer. ISBN 9780387986005.
- Jain, A.R. (1991). *The art of computer systems performance analysis*. Wiley.
- Jia, Z., et. al. (2019). “TASO: optimizing deep learning computation with automated generation of graph substitutions”. In Proceedings of SOSP 2019, pp. 47-62.
- Jurafsky, D. & Martin, J. (2008). *Speech and language processing*. Prentice Hall.
- Keshav, S. (1997). *An engineering approach to computer networking*. Addison-Wesley. ISBN 0201634422.
- Kleppmann, M. (2017). *Designing data-intensive applications*. O’Reilly. ISBN 9781449373320.
- Krishnamurthy, B. & Rexford, J. (2001). *Web protocols and practice: HTTP/1.1, networking protocols, caching, and traffic measurement*. Addison-Wesley.
- Lambek, J. & Scott, P.J. (1986). *Introduction to higher order categorical logic*. Cambridge University Press.
- Laplace, P.S. (1902). *A Philosophical essay on probabilities*. Wiley.
- Lessig, L. (1999). *Code and other laws of cyberspace*. Basic Books. ISBN 0465039138.
- Libkin, L. (2004). *Elements of finite model theory*. Springer. ISBN 9783540212027.
- Lyons, R.G. (2010). *Understanding digital signal processing*. Prentice Hall (3rd ed.). ISBN 9780132119375
- Malewicz, G., et al. (2010). “Pregel: A System for Large-Scale Graph Processing”. In *Proceedings of SIGMOD 2010*, pp. 135-146.
- Manning, C.D., Raghavan, P. & Schütze, H. (2008). *Introduction to information retrieval*. Cambridge University Press. Available at <http://www-csli.stanford.edu/~hinrich/information-retrieval-book.html>.
- Mao, H., et. al. (2019). “Park: an open platform for learning augmented computer systems”. In *NeurIPS 2019*, pp. 2494-2506.
- McKusick, M.K., Neville-Neil, G.V., & Watson, R.N.M. (2014). *The Design and implementation of the FreeBSD operating system*. (2nd ed.). Pearson Education.
- Mesbahi, M. & Egerstedt, M. (2010) *Graph theoretic methods in multiagent networks*. Princeton University Press. ISBN 9780691140612
- Mirhoseini, A., et. al. (2017). “Device placement optimization with reinforcement learning”. In *Proceedings of ICML 2017*, pp. 2430-2439.
- Mondada, F. & Mordechai B. (2018). *Elements of Robotics*. Springer. ISBN 9783319625324
- Murphy, K. (2022). *Probabilistic machine learning*. MIT Press. ISBN 9780262046824. Available at: <https://probml.github.io/pml-book/book1.html>

- Murray, D.G., et al. (2013) “Naiad: A Timely Dataflow System”, *Proceedings of SOSP 2013*, pp. 439-455.
- Myers, B.A. & McDaniel, R. (2000) “Demonstrational interfaces”. In H. Lieberman, (ed.) *Your wish is my command*. Morgan Kaufmann. ISBN 1558606882.
- Narayanan, A., et. al. (2016). *Bitcoin and cryptocurrency technologies*. Princeton University Press. Draft copy available at: http://d28rh4a8wq0iu5.cloudfront.net/bitcointech/readings/princeton_bitcoin_book.pdf
- O’Neil, C. (2017) *Weapons of math destruction: how big data increases inequality and threatens democracy*. Penguin. ISBN 9780451497338.
- Oppenheim, A.V. & Schaffer, R.W. (2007). *Discrete-time digital signal processing*. Prentice Hall (3rd ed.).
- Pasquale, B. (2015) *Black box society: the secret algorithms that control money and information*. Harvard University Press. ISBN 9780674736061.
- Patterson, D. & Hennessy, J. (2020) *Computer organisation and design*. Morgan Kaufmann (2nd RISC-V ed.). ISBN 9780128203316
- Peterson, L.L. & Davie, B.S. (2021) *Computer networks: a systems approach*. Morgan Kaufmann (6th ed.). ISBN 9780128182000.
- Pfeifer, R. & Scheier, C. (2001). *Understanding intelligence*. MIT Press. ISBN 9780262661256.
- Pitts, A.M. (2000). “Categorical Logic”. In S. Abramsky, D.M. Gabbay and T.S.E. Maibaum (eds.) *Handbook of logic in computer science*, Volume 5. Oxford University Press.
- Proceedings of the Arthur M. Sackler colloquium on the Science of Deep Learning*. March 2019. Available at: <https://www.pnas.org/topic/529>
- Rasmussen, C.E. & Williams, C.K.I. (2006). *Gaussian processes for machine learning*. MIT Press. ISBN 9780262182539.
- Reinhard, E., et. al. (2010). *High dynamic range imaging*. Morgan Kaufmann (2nd ed.). ISBN 9780123749147
- Schaarschmidt, M., et. al. (2019). “RLgraph: modular computation graphs for deep reinforcement learning”. In *Proceedings of SysML 2019*.
- Schneier, B. (2012). *Liars and outliers: enabling the trust that society needs to thrive*. Wiley.
- Siciliano, B. & Khatib, O. (2016) *Springer handbook of robotics*. Springer (2nd ed.). ISBN 9783319325507
- Siegwart, R., Nourbakhsh, I.R. & Scaramuzza, D. (2004) *Autonomous mobile robots*. MIT Press (2nd ed.). ISBN 9780262015356
- Silberschatz, A., Gagne, G. & Galvin, P.C. (2019). *Operating systems concepts*. Wiley (10th ed.). ISBN 9781119454083
- Stein, J. (2000). *Digital signal processing – a computer science perspective*. Wiley.
- Szeliski, R. (2010). *Computer vision: algorithms and applications*. Springer. ISBN 9781848829343.
- Tanenbaum, A.S. & Bos, H. (2015). *Modern operating systems*. Pearson Education (4th ed.). ISBN 9781292061429.

Telgarsky, M. (2021). *Deep learning theory lecture notes*. Unpublished lecture notes. Available at: <https://mjt.cs.illinois.edu/dlt/index.pdf>

Thrun, S., Burgard, W. & Fox, D. (2005). *Probabilistic robotics*. MIT Press. ISBN 0262201623

Varghese, G. & Xu, J. (2022). *Network algorithmics*. Morgan Kaufmann (2nd ed.). ISBN 9780128099278.

Zhang, B. (2020). *Machine learning and visual perception*. De Gruyter. ISBN 9783110595536.