**UNIVERSITY OF CAMBRIDGE COMPUTER LABORATORY**

**M.Phil in Advanced Computer Science**

**Summary List of Recommended Readings**

**October 2024**

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/2425/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.

Nicholas Cutler (Librarian)
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Aaronson, S. (2013). *Quantum computing since Democritus*. Cambridge University Press. ISBN 9780521199568.

Aaronson, S. (2016). *Introduction to quantum information science*. Unpublished lecture notes. Available at: `https://www.scottaaronson.com/qclec.pdf`.

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, 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.

Arrieta, A.B., et al. (2020). "Explainable artificial intelligence". In *Information fusion* 58, pp. 82-115.

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

Barroso, L.A. & Hölzle, U. (2009). *Datacenter as computer*. Morgan & Claypool. ISBN 9781598295566.

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

Bertsekas, D. (2019). *Reinforcement learning and optimal control*. Athena Scientific. ISBN 9781886529397.

Beverland, M.E., et al. (2022). "Assessing requirements to scale practical quantum advantage". *ArXiv quantum physics*. Available at: `https://arxiv.org/pdf/2211.07629`.

Beyer, B., et al. (eds) (2016). *Site reliability engineering: how Google runs production systems*. O'Reilly. ISBN 9781491929124. Available at: `https://sre.google/sre-book/table-of-contents`.

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`

Blackwell, A.F. (2024). *Moral codes: designing alternatives to AI*. MIT Press. ISBN 9780262548717. Available at: `https://moralcodes.pubpub.org`

Bonabeau, E., Dorigo, M. & Theraulaz, G. (1999). *Swarm intelligence: from natural to artificial systems*. Oxford University Press. ISBN 0195131592.

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`

Chilpala, A. (2019). *Certified programming with dependent types*. MIT Press. ISBN 9780262317870. Available at: `http://adam.chlipala.net/cpdt/cpdt.html`

Chakravarty, S.R., Mitra, M. & Sarkar, P. (2015). *A course on cooperative game theory*. Cambridge University Press. ISBN 9781107691322.

Critchlow, H. (2023). *Joined-up-thinking: the power of collective intelligence to change our lives*. Hodder. ISBN 9781529398434.

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`

Frank, R.H. (2008). *The economic naturalist: why economics explains almost everything*. EBury Publishing. ISBN 9780753513385

Goodfellow, I., Bengio, Y. & Courville, A. (2016). *Deep learning*. MIT Press. ISBN 9780262035613. Available at: `http://www.deeplearningbook.org/`

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.

Harper, R. (2016). *Practical foundations for programming languages*. Cambridge University Press (2nd ed.). ISBN 9781107150300.

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.

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.

Katz, J. & Lindell, Y. (2020). *Introduction to modern cryptography*. CRC Press (3rd ed.). ISBN 9780815354369 [***, II]

Keshav, S. (1997). *An engineering approach to computer networking*. Addison-Wesley. ISBN 0201634422.

Kleppmann, M. (2017). *Designing data-intensive applications*. O'Reilly. ISBN 9781449373320.

Kochenderfer, M.J., Wheeler, T.A. & Wray K.H. (2022). *Algorithms for decision making*. MIT Press. ISBN 9780262047012. Available at: `https://algorithmsbook.com/files/dm.pdf`

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.

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.

Mao, H., et. al. (2019). "Park: an open platform for learning augmented computer systems". In *NeurIPS* 2019, pp. 2494-2506.

Mermin, N.D. (2007). *Quantum computer science*. Cambridge University Press.

Mirhoseini, A., et. al. (2017). "Device placement optimization with reinforcement learning". In *Proceedings of ICML* 2017, pp. 2430-2439.

Molnar, C. (2022). *Interpretable machine learning*. Privately published. Available at: https://christophm.github.io/interpretable-ml-book/.

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

Nielsen, M.A. & Chuang, I.L. (2010). *Quantum computation and quantum information*. Cambridge University Press (2nd ed.).

Nipkow, T. & Klein, G. (2014). *Concrete semantics with Isabelle/HOL*. Springer. ISBN 9783319105413. Available at: http://concrete-semantics.org /concrete-semantics.pdf

Nipkow, T., Paulson, L.C. & Wenzel, M. (2002). *Isabelle/HOL: a proof assistant for higher order logic*. Springer. ISBN 3540433767.

Nowak, M.A. (2011). *Super-cooperators: evolution altruism and human behaviour*. Canongate. ISBN 9781847673367.

Oppenheim, A.V. & Schafer, R.W. (2007). *Discrete-time digital signal processing*. Prentice Hall (3rd ed.).

Ousterhout, J.K., et al. (1985). "A trace-driven analysis of the Unix 4.2 BSD file system. In *ACM SIGOPS Operating systems review* 19(5), pp. 15-24.

Patterson, D. & Hennessy, J. (2020) *Computer organisation and design*. Morgan Kaufmann (2nd RISC-V ed.). ISBN 9780128203316

Pierce, B.C. (2002). *Types and programming languages*. MIT Press. ISBN 0262162091.

Pierce, B.C. (2005). *Advanced topics in types and programming languages*. MIT Press. ISBN 0262162288.

Pierce, B.C., et al. (2023). *Logical foundations*. Privately published. Available at: https://softwarefoundations.cis.upenn.edu/lf-current/index.html.

Pierce, B.C., et al. (2023). *Programming language foundations*. Privately published. Available at: https://softwarefoundations.cis.upenn.edu/plf-current/index.html.

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.

Rudin, C., et al. (2022). "Interpretable machine learning". In *Statistics surveys* 16, pp. 1-85.

Schaarschmidt, M., et. al. (2019). "RLgraph: modular computation graphs for deep reinforcement learning". In *Proceedings of SysML* 2019.

Sergey, I. (2014). *Programs and proofs: mechanizing mathematics with dependent types.* Unpublished lecture notes. Available at: `https://ilyasergey.net/pnp/pnp.pdf`.

Shao, J., et al. (2022). "Tensor program optimization with probabilistic programs". In *Proceedings of NeurIPS 36.* Available at: `https://arxiv.org/pdf/2205.13603v2`.

Silberschatz, A., Gagne, G. & Galvin, P.C. (2019). *Operating systems concepts.* Wiley (10th ed.). ISBN 9781119454083

Sites, R.L. (2022). *Understanding software dynamics.* Addison-Wesley. ISBN 9780137589739.

Stein, J. (2000). *Digital signal processing – a computer science perspective.* Wiley.

Sutton, R.S. & Barto, A.G. (2020). *Reinforcement learning: an introduction.* MIT Press (2nd ed.). ISBN 9780262039246.

Szeliski, R. (2010). *Computer vision: algorithms and applications.* Springer. ISBN 9781848829343.

Szepesvári, C. (2020). *Algorithms for reinforcement learning.* Springer. ISBN 9783031015519.

Tanenbaum, A.S. & Bos, H. (2022). *Modern operating systems.* Pearson Education (5th ed.). ISBN 9781292459660. Available at: `https://csc-knu.github.io/sys-prog/books/Andrew S. Tanenbaum - Modern Operating Systems.pdf`

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

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.