# CS4200/CS5200, On-line Machine Learning

## Class 9: Reinforcement Learning

Yuri Kalnishkan

Department of Computer Science
Royal Holloway, University of London

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## Class Outline





## References

[SB] R. S. Sutton and A. G. Barto, “Reinforcement Learning: An Introduction”, 2nd edition, The MIT Press, 2018

[CS] C. Szepesvaŕi “Algorithms for Reinforcement Learning”, Morgan & Claypool, 2010

[JT] J. N. Tsitsiklis, On the Convergence of Optimistic Policy Iteration, JMLR 3 (2002) 59-72

[WD] C. J. C. H. Watkins and P. Dayan, Technical Note: Q-Learning, Machine Learning, 8, 279-292 (1992)



1. Motivation and Preliminaries

# Example: USPS

- the problem is to label an image, which is a $16 \times 16$ matrix of pixels
  — it is known that an image represents a hand-written digit, from 0 to 9
- we are given a training set containing a large number of labelled images
  — USPS dataset: scanned zip codes from envelopes

# Revision Questions for CS4200/CS5200, On-line Machine Learning, Class 9

Disclaimer: This list of questions has been produced to help students in revision. There is no guarantee that the actual exam questions are in this list or that they will be in any way similar!

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