Computer Science at Hertford College

Sept 2026 Open Day *Peter's Talk in CS (Robert Hooke Building): 10:45*
Meeting in Baring Room, Hertford College: 12:30

Hertford College admits students for both the single honours degree in Computer Science (CS), and the joint honours degree in Computer Science & Philosophy (CS&P). *We expect to admit THREE students per year in Computer Science, and FOUR or FIVE students per year in Computer Science & Philosophy*. Because we have separate "quotas" for the two subjects (unlike most other colleges), applicants for CS and for CS&P are not in direct competition for places with each other.

Hertford students in the two degrees are mostly treated as a single cohort, and accordingly we consider CS students to be "honorary philosophers" for the purpose of invitation to social events (including our Cotswold Retreat before the summer term). This gives a distinctive flavour to CS at Hertford, which is the leading college for CS&P, and commonly hosts events – often planned and organised by our students – on the borderline of the disciplines, concerning not only technical topics, but also such things as moral issues of AI (robots, privacy, security etc.) and futuristic possibilities (uploaded minds, superintelligence, etc.).

Hertford Academics in Computer Science and AI

Professor Andreas Galanis is Tutorial Fellow in Computer Science at Hertford College and Associate Professor of Algorithms & Complexity Theory in the Faculty of Computer Science. His research focuses on studying large scale systems that arise in computer science and statistical physics, and understanding whether the statistics of such systems can be computed efficiently. In particular, one major component of his work is to identify those aspects of the behaviour of a system that have an effect on our ability to analyse it using computational methods.

Professor Mark van der Wilk is Tutorial Fellow in Computer Science at Hertford College and Associate Professor of Machine Learning in the Faculty of Computer Science. His research investigates Occam's Razor: the notion that the simplest explanations are most likely to be correct. This can be formalised mathematically using information theory, and is important in machine learning where we aim to explain data that we have seen in the past (training data) in order to make good predictions of what may happen in the future. These concepts are related to many open problems in machine learning (quantifying uncertainty, learning while interacting with the environment, causality), and may help create better training procedures. Mark is also interested in applications, particularly where small amounts of data need to be used to guide decision making (e.g. in optimising chemical reactions or drug discovery), and has advised companies. He also wonders about how AI will influence society, and how we can create tools to enhance our human rationality and agency in the future.

Dr Andrey Kravchenko is Lecturer in Computer Science at Hertford College, and has been a Lecturer at Oxford since 2020. His current research focus is on the theory and application of anomaly detection in big data, and in particular, the development of efficient machine learning algorithms based on the embedding of vectors. He is also exploring broader connections between machine learning models and knowledge-based systems. Machine learning models do not involve human expertise and are often very hard to interpret. Knowledge-based systems are easy to translate into an interpretable form but are based on human domain expertise and therefore require significant manual work to build. Andrey's research aims to work towards bridging the gap between these two different aspects of artificial intelligence.

Professor Peter Millican is Gilbert Ryle Fellow and Professor of Philosophy, and also in the Computer Science Faculty. Before coming to Oxford, Peter was Senior Lecturer in Computing and Philosophy at Leeds University, teaching and researching there for 20 years. Once in Oxford, Peter conceived the new degree programme in CS&P, which started in 2012 (and for which he teaches the cross-disciplinary course "Alan Turing on Computability and Intelligence"). Although his main research is in Philosophy (with particular interests in David Hume, Alan Turing, philosophy of AI, epistemology, philosophy of language, and philosophy of religion) – see handout on "Philosophy at Hertford" for more details – he continues to be very active in Computing, focusing on software development for education and outreach (see www.philocomp.net for examples of systems he has written, and especially www.turtle.ox.ac.uk).

Professor Carissa Véliz is Tutorial Fellow in Philosophy, teaching courses in Ethics, and especially AI and Data Ethics, which is her main research focus (see https://philpeople.org/profiles/carissa-veliz). Her Penguin book *Privacy is Power* came out in 2020, provoking many interviews that may be of interest. She is also the editor of the *Oxford Handbook of Digital Ethics* (2021), and has more recently published two further books, *The Ethics of Privacy and Surveillance* (2024) and *Prophecy* (2026).

Professor Mike Wooldridge, Professor of Computer Science, is one of the most widely cited AI researchers in the world, well known as presenter of the 2023 Royal Institution Christmas Lectures, and as author of *The Road to Conscious Machines: The Story of AI* (Penguin, 2020). His main research is in the formal theory and practice of autonomous agents and multi-agent systems, an area of considerable philosophical interest with links to artificial intelligence, logic, and modelling of social and economic systems. Peter and Mike have jointly authored work on the boundary between Philosophy and Computer Science.

First Year Course Outline

Single honours Computer Science involves all of the courses below; Computer Science & Philosophy omits the four that are italicised, replacing them with courses on Philosophical Topics in Logic and Probability (PTLP), General Philosophy, and Alan Turing on Computability and Intelligence (Turing).

Michaelmas (autumn) term	**Hilary (spring) term**	**Trinity (summer) term**
Discrete Mathematics	Design and Analysis of Algorithms	Introduction to Proof Systems
Functional Programming	Imperative Programming	
Probability	*Digital Systems*	*Digital Systems*
Linear Algebra	*Continuous Mathematics*	

The overlap between the two degree programmes is thus considerable, especially since PTLP and Turing together give a substantial grounding in logic, proof theory, probability, and some further aspects of mathematics and theory of computing (e.g. computability and models of computation). Hence we would treat very sympathetically any request to change degree programme from one to the other after the first year (subject to acceptable academic performance and – in the case of a proposed change from CS to CS&P – evidence of serious interest and potential capability in Philosophy).

Admissions

The first – and very important – hurdle is the Test of Mathematics for University Admission (TMUA): your performance in this (in October; but *you have to register in September*!) will largely determine whether you get asked for interview. So if you are thinking of applying, developing your mathematical ability should be your primary target until then! If you are applying for CS&P, don't worry about neglecting Philosophy, because we don't expect applicants to have studied the subject before, so if you are strong at mathematical and logical thinking, relative ignorance of Philosophy is not a problem (hence it's fine to postpone any pre-interview reading – e.g. of Stephen Law's excellent *Philosophy Gym* so as to have an answer to the question "What issues in Philosophy interest you?" – until after the MAT has taken place).

Computer Science admissions are coordinated across the colleges, with every candidate who gets past the aptitude test being interviewed at two colleges, and the results pooled. If any college is over-subscribed with strong candidates, some of them are likely to be interviewed at a third college also, to ensure that the best candidates are admitted overall. So choose the college you'd most like to attend – there's no need to worry about "game-playing" to improve your chances. Competition for Hertford places will be strong, but this is no reason to worry: in one recent year, for example, four other colleges also accepted Hertford College applicants, so most of our candidates who made it through the MAT were accepted at Oxford.

Finding Out More

If you think you might like to join our community in Computer Science and Computer Science & Philosophy at Hertford College, please feel free to email peter.millican@hertford.ox.ac.uk and/or andreas.galanis@hertford.ox.ac.uk, and ask any questions you might have.