King's Student Perspectives

Computer Science with Maths

Profir, 1st year

Profir is from Chișinău, the capital city of the Republic of Moldova (which is between Romania and Ukraine). He took A levels the UK before studying Computer Science at King's.

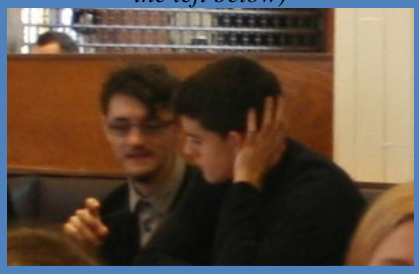
What attracted you to the course?

I have always had a particular interest in Computing, even long before I had to decide on a university course. My focus was definitely more towards the theory of information technology rather than programming per say. Considering that Computer Science is a specialized form of Mathematics, Cambridge University was my primary choice based on (but not exclusively because of) the high university rankings for both subjects. Since my main passion is robotics and artificial intelligence, the fact that Alan Turing is an alumnus of King's College influenced my decision to apply to King's College heavily!

How did you find Freshers' Week?

Freshers' Week was a hectic experience! I remember a flood of faces and names, and then a struggle to remember as many as possible. Settling in was easy though, and there was always someone to help you out with the initial paperwork etc. All in all, it was a unique experience. I was a bit scared of getting too carried away in Freshers' Week, since the lectures were just beyond the horizon, so this cautious approach stopped me from overdoing it and going to too many events, in case I struggled with the first lectures once they started.

Chatting with other freshers in King's bar on my first day (I'm second from right in the back group above, and on the left below)



What did you find most difficult?

As a non-native English speaker, the most difficult thing by far for me was getting used to all the different speech patterns of the lecturers. Over time, I've found that I do get used to their different styles and the problem fades, but it always reemerges at the start of term, until I re-adapt to their specific speech patterns.

They try to level the playing field a bit by introducing programming through a language that most students are unlikely to know prior to the course.

Do you need to know programming languages?

No - you don't need to know any programming languages before you start the course, and they even try to level the

playing field a bit by introducing programming through a language that most students are unlikely to know prior to the course even if they have done some programming. I'm sure that you could work out which language they use by going on the Computer Lab website, but my advice is that it really would be best not to learn this language beforehand, as you'll get more use from the lectures this way. What I would say is that a knowledge of algorithms comes in handy throughout the course. So while not essential, even just reading through some Decision Math A-level course books would give you a bit of insight into the type of work that is done here in a more rigorous manner.

A knowledge of algorithms comes in handy throughout the course.

I recommend that you try to program the examples out as often as possible and see how they behave on a computer rather than just in theory.

What is the teaching like?

Supervisions consist of examples and problem-solving or work on past papers, which are usually a bit wordier than the examples. The questions usually require you to re-read your lecture notes and to interpret them in new ways, independently of what you've done previously or in lectures. While it is possible to do all the non-lab exercises without ever turning a computer on, I would still recommend that you try to program the examples out as often as possible, and see how they behave on a computer rather than just in theory. You might get it wrong a few times, but that is usually a good thing when you're learning, since you can then ask yourself why it went wrong and thus know what to avoid when implementing them in other circumstances.

The style of lectures is a bit different from what I was expecting. Specifically, there is more freedom in terms of what you can attend than I thought that there would be. However, this is both a blessing and a curse, since there are so many interesting lectures and we are expected to manage our own time more than in many universities! Given enough spare time (spare time is a mythical creature said to exist, and just sometimes I believe that it does actually get less mythical and more real!) you could potentially go to lectures from all sorts of other courses taught by the University that you might find interesting even though they're not necessarily directly related to Computer Science.

There is more freedom in terms of what you can attend than I thought that there would be.

Lunch in the hall (you can eat in the hall, or take food through to the bar if you prefer)

What are you studying this year?

The first year in Computer Science is a bit odd, since you spend your time doing 50% Computer Science and the other 50% is option papers. Your 50% options could be 25% Math (the same math course that Natural Scientists take) and then either a 25% Natural Sciences option (people usually take Physics though there are

I chose to do Computer Science with Mathematics.

other choices), or 25% Psychology; or alternatively, your option can be a full 50% of Mathematics.

In my case, I chose to do Computer Science with Mathematics. During the Computer Science lectures, we have on the one hand an introduction to programming practices, with algorithms and their analysis, and the mathematics needed to describe them, and on the other hand, introductions to digital electronics and operating systems. Then, in the Mathematics lectures, we study Vectors and Matrices, Differential Equations (that is, Ordinary Differential Equations and basic Partial Differential Equations), Mathematical Analysis (in the context of real numbers) and Probability (from classical probability to working with random variables and their associated distributions).

By far the most interesting thing I have studied so far is Regular Languages.

By far the most interesting thing I have studied so far is Regular Languages. It provides us with proper formal tools that can talk about mathematical systems, and consequently the necessary tools to talk about algorithms in the most abstract sense.

What's the timetable like?

Lecture-wise, the timetable is two to three lectures a day, Monday through Saturday, and supervision-wise we usually have two to three supervisions per week, though the number is not fixed and sometimes it can go up to five supervisions in one week. In addition to this, during the first two terms there is a weekly programming lab session and a bi-weekly hardware lab session, during which you have to work on practical problems of the relevant kind and then have them marked. They are marked on a pass / fail basis, i.e. you get a tick if you have done the problem satisfactorily; but don't worry, as if you find them easy, for those that like a challenge, there are more interesting questions marked with a star, which you can always at least try, and I would recommend doing so.

Where do you have to go?

For first year, all the lectures are in the Arts School on the New Museums Site, which is a five minute walk from King's; however, in second year the lectures are on the West Cambridge Site, which due to the distance I would recommend cycling to (you can walk there, but it takes about twenty minutes so most people cycle, which is much faster). For the 50% Mathematics option (my chosen option), the lectures are once more very close to King's, on the New Museums Site.

The Computer Faculty on the West Cambridge Site (the white tent-like structure is above the cycle park – to keep bikes dry!); Below – inside this building

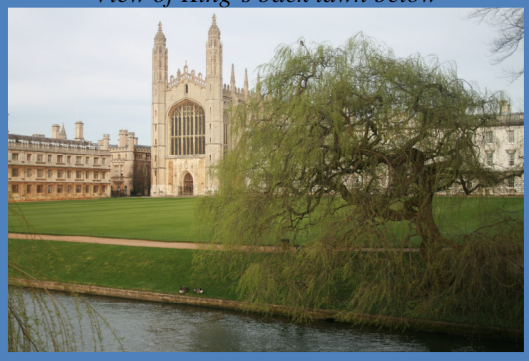
How do you find the workload?

The workload can seem daunting if not managed properly. It is generally a bad idea to rush too far ahead unless you really are sure about the material (this is a generalisation, of course, and should be treated as such; depending on circumstances, it may be that you have solved similar tasks before). A challenging question can take anything between five minutes and a few days to properly digest, and this is the very reason why the workload can seem scary.

I've found that as long as you make sure that you start thinking long before you start writing, things flow a lot easier once you get to solving the problems though.

When not working on University assignments, I like to either read short novels or try to do something completely unrelated to programming, like photography, which I try to practice as a hobby in my the free time (and King's even has a dark room!).

Snow fun in Bodley's Court above,
View of King's back lawn below



The community at King's has an interesting dynamic to it.

How do you find living in the College community?

The community at King's has an interesting dynamic to it. In any group, it is natural for people to form (micro)groups based on shared subjects and/or interests and hobbies, but the fact that the King's community is not based on a single subject leads to less rigidity in how groups form, and a lot of interaction with students doing related subjects. Not only this, but during events and activities, the subject boundaries are non-existent so you also get to know people doing entirely different subjects.

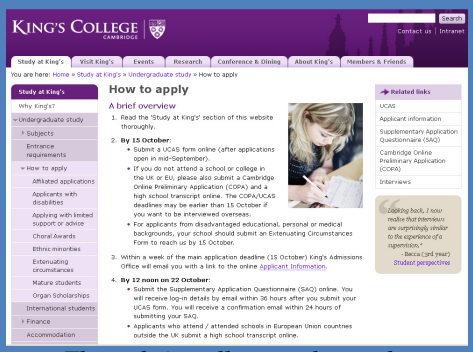
In my case, since I mostly like to work in my room, I always eat in the hall, so most of my socializing happens just before, during, and just after eating (while I have a quick rest in the bar). I admit that I'm slightly biased to mostly talking with the engineers or mathematicians, since they are closest by subject, but that doesn't stop me from listening to students studying other subjects. When I am able to contribute, I do so in discussions about all sorts of diverse topics. I am truly glad that this opportunity exists, because in this way I can prevent myself from only delving into a world of Computer Science and forgetting about all other topics. In addition, most interesting phenomena that I've managed to notice so far usually require a mix of subjects in order to be described in a reliable manner.

Most interesting phenomena I've managed to notice so far usually require a mix of subjects in order to be described in a reliable manner.

What are the best and worst things about studying Computer Science?

The best thing about Computer Science is also the worst thing! As a Computer Scientist, you will be the go-to person for computer-related advice or help if a computer breaks for one of your friends, or if they want to do something more complex on a computer. This is the best thing, because provided that you are willing to help them, you get to see different issues and how they arise, or practice your skills in real life situations. However, at the same time, if it happens too often this can get a bit distracting, or you might find the state some systems can end up in a bit bizarre!

As a Computer Scientist, you will be the go-to person for computer related advice.



The website tells you what to do.

What was the application process like?

The application process was straightforward, and all the non-UCAS steps had properly explained steps, if not overly detailed ones (though this was a good thing!).

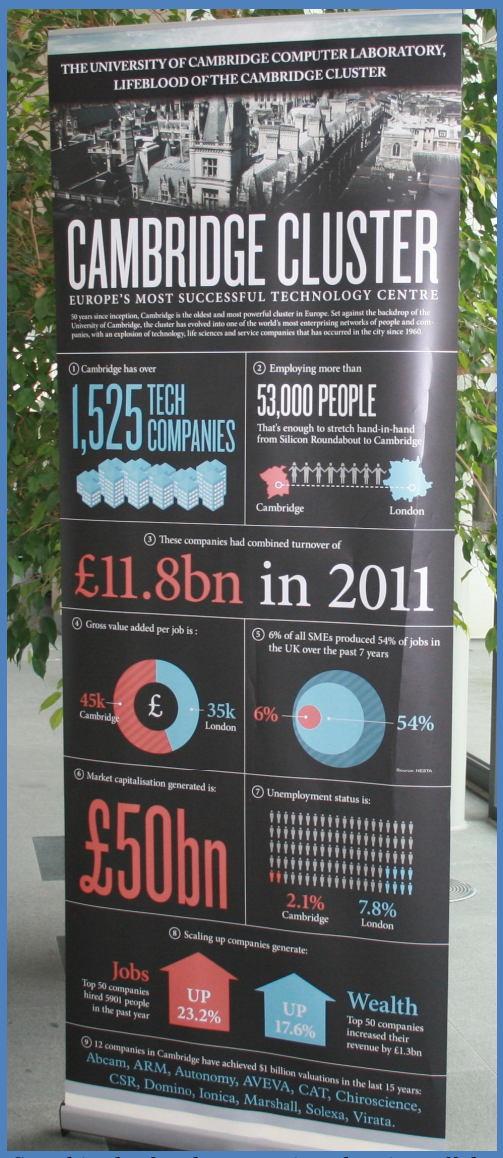
The online application process was then followed by two interviews and (for me) two quick exams/tests in early December - a Mathematics one (which you only take if you apply for Computer Science with Maths) and the Thinking Skills Assessment (though this one is no longer set at King's).

I did A-levels in the UK rather than my national diploma. I had to travel to Cambridge from my Sixth Form College by train. The journey was about three hours, but I only had one change, so I didn't have any difficulties. Despite arriving at about midnight, I was greeted by the King's porters and helped to find the overnight room I'd been allocated. The next day, working my way from interview to interview or the next test was fairly easy because we were given maps and details of how to find the specific buildings, and there was a student helpdesk. On the one occasion when I did get a bit lost, I just asked a student at the helpdesk, explaining my situation, and was promptly shown to the room.

During all the time I was in King's, I was of course worried, especially because everyone around seemed dauntingly intelligent, however, I am sure that everyone had similar worries!

Since I chose the Computer Science with Mathematics option, I had to take STEP exams after getting my offer, similar to the candidates applying for Mathematics. While this may seem scary, if you like Mathematics, they can actually be quite good fun.

While STEP exams may seem scary, if you like Mathematics, they can actually be quite good fun.



Stand in the faculty reception showing off the Cambridge cluster of tech companies and their links with the faculty.

What advice do you have for prospective students?

Read the recommended reading! You will be surprised how much of it you will encounter if not during interviews themselves then for sure during your first year. Also, don't be scared to apply if you haven't done any programming before, and don't try to rush learning a language before you start your first year here either. You don't want to pick up bad programming habits, as they are a real problem to deal with. Sadly, I had to fight a few of them myself, in particular "hacks" or "tricks" that only work in one particular language.

What are you looking forward to next year?

As you might have guessed if you've looked through the options for Computer Science further down the line, I am looking forward to the Artificial Intelligence course. Other than that, I am looking forward to the theoretical courses mostly, in particular Logic and Proof, and Computational Theory.

March 2014

I am looking forward to the Artificial Intelligence course.

A note to current King's Computer Scientists:
If you would like to write about your experiences of studying Computer Science at King's for our prospective students to read, please email Kristy in the Admissions Office for further details: undergraduate.admissions@kings.cam.ac.uk.