Transcript

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Venus Liao

Good afternoon. My name is Venus Liao. I'm the Regional Recruitment Manager at Swinburne University. I'm responsible for the Australia Onshore and New Zealand region. Thank you for joining us today for virtual training on Swinburne IT and computer science. This is part of the onshore webinar series that I'm running from the month of May to July.

Today we'll be hearing about how Swinburne IT and computer science have been impacted by COVID-19, and how we as a university are preparing our students to deal with the situation in future scenarios. We will also be talking about the projection for emerging jobs in this field.

If you have any questions during the presentation today, please put your questions in the Q&A box down below. At the end of the webinar, we will try to leave five to 10 minutes to go through the questions together.

I would like to introduce today's speaker, Dr. Chris McCarthy, Senior Lecturer in the Department of Computer Science and Software Engineering at Swinburne University. Over to you, Dr. Chris McCarthy.

Chris McCarthy

OK. Thank you very much, and welcome everybody. And I hope everyone's safe and well, wherever you are in the world. It's my pleasure today just to talk about an area of great passion for me in computer science, and some of the emerging areas of interest in this area, where jobs and career opportunities exist. And I'll also, as was mentioned, touch a little on COVID-19 itself, and how we can look at computer science going forward in the post-COVID-19 era, which, of course, computer science will have an immense role to play.

So that's me. Just to briefly introduce myself, as was mentioned, I'm an academic and a lecturer in the Computer Science department at Swinburne. I teach a range of units there, including software development units, computer systems, mobile development. I am also a researcher in computer vision and machine learning and in other areas. So some of these topics I'll actually touch on today as well.

So my intention in this talk-- in this webinar-- is to give you a snapshot. Obviously, in the time frame I can't go into great depth, but I want to talk about some of the really emerging areas of computer science and IT that I believe have the greatest impact going into the post-COVID era as well.

And so I just want to touch on each of these ones. And you can see them here, the pictures indicating essentially what is my overview. AI-- Artificial Intelligence-- cloud computing, big data, and cybersecurity are probably the four major topics I'd want to briefly touch on today, and then talk a bit more about emerging careers in this area.

So artificial intelligence is where I'll start. And I just want to define that properly, which is actually a little bit of a tricky thing to define. When I say artificial intelligence, we all have our ideas of it with respect to maybe how we've experienced it inside science fiction, or even how we're now experiencing it in our daily lives.

And that's really my point about this area-- is that one of the things that's occurred, particularly in the last 10 years, is that we've seen artificial intelligence go from something that was in the research domain-- very much being investigated, but not really being used in everyday applications or industrial applications-- to suddenly having quite a big impact on our daily lives.

We just have to look at our phones with face recognition, for example, which is again-- computer vision being one of my areas of interest. That's been one of the great success stories of AI in the modern era. And now we're seeing machine learning really driving whole ranges of applications of AI to classify things, to detect anomalies, to find, indeed, cells in samples to identify, for example, perhaps COVID-19. These types of activities are what we're looking at with AI at the moment.

So ultimately, it's a field really looking at how we use computers to essentially achieve some level of human level of intelligence with respect to particular problems. Obviously, we're not at a point yet where we have created a humanlike AI overall, but in particular problems where there is a high level of interpretation required, where the data is extremely noisy-- particularly sensor data like visual data or sound data-- then having AI systems that can interpret that kind of data reliably is really what we're looking at.

In terms of what underpins-- in terms of discipline areas, and indeed, where the employment opportunities are in AI-- there's really a number of ways to cut it. One is, obviously, software development remains core. All of these systems are ultimately driven by software, and so software development is obviously there. Again, in the context of running software, there's also specialized needs like parallel programming or GPU programming-- these types of skill sets which are a bit more specialized.

On the other hand, the application of a lot of the existing AI techniques and algorithms requires also people with the skill sets around mathematics, statistics-- which all come under the banner of computer science as well, in terms of how they're applied-- but also having knowledge and knowhow of some of the existing platforms that happen to be around at the moment, like Amazon Web Services as a simple example. Microsoft Azure, as well. These types of tools are being used a lot in industry, and so having knowhow about how to use those things to solve problems is certainly high in need at the moment.

So AI is really a growing area. It's really arrived, and so there's plenty of opportunities. And I'm going to show a slide a bit later which will show you where, indeed, how it's been in terms of jobs being looked at-- how many of those jobs relate to AI.

Another field-- this is actually less emerging as a problem-- big data has been around a while now, actually, but the need never goes away. The scale at which we consider data to be big is always growing, and so the need is always growing as well.

We used to think about megabytes or gigabytes as being large, but now we talk about terabytes and petabytes as being pretty much the standard. We're collecting data all the time. This diagram on the right of my slide really points out, I think, the three major threads of need in this space when we're dealing with big data.

One is the variety of data, and indeed, computer science very much has a lot of focus on how we design our systems to handle the different types of data. There's no one size fits all approach to that. If it's text data, versus image data, versus even video data, or sound data, or web logs-- all of these different types of data have different properties, and so computer science is very much focused on solutions that fit those different types of data needs.

Volume is already what I've talked about. It's growing. How do we manage the large amounts of continuously collected data that permeates almost all industries now, particularly when we're putting sensors out into the world collecting data as well.

And then there's the other issue, which is speed of access to data, as well as analysing that data and getting meaningful information from it. The problem of collecting data is not really the challenge. The challenge is, what do you do with it? How do you manage it? How do you use it to solve the actual problems you want to solve?

And so the disciplines that underpin this-- again, software always is going to be present. We need software to manage these systems. We need database design and management, so people who can think about how to store data in a way that actually makes sense for the particular needs of that organization.

We also need algorithms and ways to visualize this data as well. So there's a lot of interest now in people who can take data and visualize data in meaningful ways to make decisions from. Cybersecurity, which of course is a topic I'll touch on separately, but is clearly linked to big data. How do we keep this data secure? How do we transfer it securely?

So this is a need that is not going away. We're only collecting more and more data, and computer science is at the forefront of how we handle that.

Cloud computing is the other topic I wanted to touch on. And increasingly-- and I think this one, of all the topics I'm talking about in the post-COVID-19 era, I think cloud computing might be the most relevant. I say this because right now, I'm at home. I'm working at home, and I think a lot of us probably are.

And we're having to do the things that we would normally do in our workplaces at home. Thankfully-- and I do think it is a thankful thing-- that while of course this situation we're in is not a great situation, if it had happened even 10 years ago, we wouldn't be in the same position we are now to do what we're doing, because of the fact that we have so much of what we do on the cloud.

And by the cloud, I mean on servers that are remote that allow us to access things regardless of where we are. As long as we have internet connection, we can do a lot of our tasks.

So cloud computing has many levels to it. It could be at the level of probably what most people experience, which is applications that we simply access via our browser. For example, Google Docs, Google Sheets-- these types of things.

But at another level, and what we're really seeing now, is more scaled up cloud computing, where there are a lot of computer science needs to support it-- platforms as a service, in which we provide not just one piece of software, but whole suites of software to tackle real-world problems. So probably the most well-known example of such a thing would be Amazon Web Services, for example.

So indeed, in that context, something like AWS-- having the knowledge of how to use these tools, which are becoming increasingly standard now to use-- is a need. There's a lot of organizations who simply need people who understand how these cloud-based services work, and can use those effectively to solve problems, particularly around data analytics and these types of problems.

Infrastructure as a service is really just the next level up, where we in fact defer our entire operating system-- our environment that we work in-- to the cloud. So we're not working individually on PCs anymore, for example, but literally working with remote servers, doing all the management of our networking and things like this.

This is all happening. And at the moment, because of our current situation, I think there's going to be incredible drive towards this going forward as we realize more and more we need to support remote work and virtualized offices, for example.

And across all sectors, cloud computing is going to have a major impact, and I think it's probably one of the biggest things that'll come out of the COVID-19 pandemic-- is a focus on cloud computing and supporting it. So there's lots of areas here, I think, where there's opportunities for careers-- in supporting cloud computing, and also using cloud computing services.

The last of the emerging big topics I wanted to touch on is cybersecurity, which is another topic which has been around for a long time, but increasingly has become more and more pertinent, really because of some of the things I've already talked about. Think about cloud computing. Think about big data. The fact that these two things are emerging-- both the storage of data remotely and services online-- the way we transfer sensitive information and store sensitive information-- has really ramped up the need for cybersecurity as a focus.

And indeed, governments around the world-- industries around the world-- have identified the fact that cybersecurity might be the biggest priority in their IT needs of all the needs they have, because they've got to keep things secure. And it's constantly an arms race against the people that want to, of course, find ways to break in and get data, or intercept data being transferred.

So this is a growing need that, frankly, is booming in terms of the career opportunities for people doing this, whether it's on the side of the more technical-- developing software that is secure or finding ways to secure networks-- these types of things-- but also in the management of it. How do

you determine at what level of protection certain information assets should be? These types of decisions require a lot of knowhow and a very thorough understanding of how to secure systems.

And also, from the organizational point of view, how do you make sure people-- your employees-- actually adhere to protocols that manage security as well? So this is a large, large problem with lots of facets to it. And again, at the core of it is computer science and IT, the systems we put in place, and the software that we develop.

All of this is a growing need, and if you look online for jobs in this area, you'll see plenty of them. It's not going away. And again, COVID-19 haw only exacerbated the need for security. Even in the current climate we're talking about, the security of these very video conferencing tools we're using-- these are the sorts of topics that people are talking about. So clearly, this is front and centre of needs going forward.

Computer science-- what I really find rewarding about being in computer science is how it touches all elements of our society. This diagram here-- or this figure here, really-- just shows the sorts of areas where computer science is now really at the centre of how they work. Whether it's finance, which we know-- fintech-- or health-- eHealth, digital health.

These are areas where things are growing immensely right now. In government, we're seeing more and more how computer science is being used to basically run government, to provide services to the community through increasingly data-driven techniques, as well, for finding out how to best provide services to a community using computer science. Agriculture, mining-- certainly here in Australia, these are big areas where we're seeing computer science being embedded as well.

And I also mentioned internet of things. There's the idea that we're putting lots of ways of collecting data out into the world now. We collect data from all sorts of places. We know where pedestrians are in the city. We know where water is flowing on a farm. We use sensors constantly to collect data, and so how do we make sense of that data? How do we make decisions from that data? This is where we're finding plenty of opportunities for people with computer science and IT skills to make a difference and have an impact.

Focusing, as I mentioned I would, on COVID-19, there are obviously a lot of current roles for computer science in the actual pandemic itself, in terms of fighting it. And one of the obvious areas that I'm sure you've probably thought about is looking at artificial intelligence and data analytics. Clearly, this particular aspect of computer science has a role to play right now, and is indeed informing how we put into place things like social distancing rules-- how we best target interventions to make sure that the pandemic is handled. So this is an obvious area where computer science has a role right now.

But I really wanted to focus in this talk a little bit more on-- let's think about the post-COVID-19 world, as I've been mentioning so far. We don't know exactly what that will be, I think. That's one of the things that's-- right now-- front and centre.

But what we can se is that suddenly, en masse, the world is understanding that maybe we need to find good ways to communicate and work together remotely. And so I think there will be an absolute

focus on how do we best facilitate that, perhaps more than we were already trying to do. Now we know how much of a priority this is.

So things like video conferencing-- how we work collaboratively online-- I think this is an immensely growing area for computer science, where we're looking at software systems that support that. And all those topics of big data and cloud computing is part of that-- all platforms to support it. I think that's going to be a big priority.

Clearly, digital health already was an emerging topic, but has become front and centre with the current climate of COVID-19. Telemedicine-- virtualizing hospitals, for example-- so that we can have people-- they might be in bed somewhere, but perhaps the care is being delivered remotely so that we can protect our frontline workers from potentially getting ill themselves.

This is clearly a priority right now, and I think going forward will continue to be a priority. So supporting this is going to need a lot of IT support, and that's where I think there's a lot of opportunity. Cybersecurity I think I've already mentioned plenty of. It will continue to be a major, major theme in IT and computer science for many years.

And also I mentioned last on this slide software development. It's the core foundational skill of computer science, and it'll never go away. As much as we have lots of tools available to us now online that don't necessarily require high technical knowledge, we are still always needing people who can code-- who can script up solutions to make things work, to bring things together, so that we can make effective solutions that work for particular needs. So software development is still always going to be in demand, and so anyone getting a computer science degree focused on software development is certainly going to have plenty of work ahead of them, I think, for years and years to come.

I wanted to also reflect what is out there in the workplace at the moment, in terms of what jobs are on offer. This is taken from a very recent LinkedIn emerging jobs report. This was for Australia, but I've scanned a few countries and it's pretty similar, to be honest. The rankings here are pretty much the same.

These are basically the fastest growing position descriptions being advertised on LinkedIn right now. And as you can see, I've taken from the top 15 the particular positions which relate to computer science. And you can see it's more than half of them. Clearly this is where the focus is.

Number one, artificial intelligence specialist, is for me quite a remarkable thing. It wasn't that long ago that artificial intelligence was simply something we thought happened in movies in terms of its impact. Now it's being seen as something where there's actual specializations just for that that people need.

Cybersecurity-- no surprise that that's of high demand. And you can see here also data scientists, data engineers-- people basically focused on analysing data and finding and building the infrastructure for storing and analysing that data-- is in high need as well. So there's certainly plenty of opportunities in computer science and IT going forward, and it's obviously a focus in the current job market.

In terms of-- one of the things about computer science that I think is really-- it's not necessarily unique to computer science, but it's very much the focus-- is computer science is constantly changing, right? The technologies and the ways we use technology are going to be always adapting and evolving. You don't have to look far back in history to think of what we were thinking about then compared to now, and how much that changes so quickly.

So if you are someone thinking about this as a career choice, the sorts of things you need to be prepared to learn, as well as the technical knowledge, is being able to be familiar and ready for the changes and trends that will happen.

You need to be able to adapt to disruption. That's one of the things we've really learned in the last few years. Things change rapidly. Being able to adapt to that-- being current with what's going on-- really helps to do that.

You need to also be equipped with both the theory, but also the practical knowhow. That's really what the people looking for people in this space-- what they're trying to find in terms of employees. It's people who have that mix-- who know what they're doing, have a deep knowledge of what they're doing-- but also have that practical ability to deliver.

And also, you need to be passionate about applying skills in other industries. Most computer scientists out there may not be actually in just a software company. They're likely to be embedded in other industries trying to solve their problems. And so I think this is why it's such an exciting area to be in right now, and that's not going to change.

I wanted to very quickly touch on how Swinburne-- how we're doing that-- without being too forceful about degrees or anything here, but just to talk about-- we have basically two pathways that we really offer In terms of degrees.

A degree of Bachelor of ICT and a Bachelor of Computer Science are the two main ways for undergraduate study. All of the topics I've just touched on are all majors within our courses. We also have master's programs around IT, data science, and cybersecurity as well.

Another thing Swinburne is well known for is our industry placements and our industry-based projects. We use our industry links very heavily to make sure that what we deliver is current with respect to industry standards. And so a lot of the topics I'm talking about here are also related to projects where I've been involved with industry, trying to solve these types of problems with them as well. So that informs how we how we teach our units as well.

So with that, I've reached my 20 minute limit, so I'm going to stop there. And if you have any questions, I'm more than happy to answer them, and I'll hand back to Venus. Thank you very much.

Venus Liao

Fantastic. Thank you so much, Chris. We've already got some of the questions coming in during the presentation, so I'm just going to read the questions to you. So this question is asking about, is there any particular Section 1 and Section 2 universities of Bangladesh that Swinburne University accepts for postgraduate programs? I might throw this question to Mahdi, actually.

Mahdi Shariatian

Thanks, Venus. I was about to write back to [INAUDIBLE]. Thanks for the question, [INAUDIBLE]. May I just get back to this offline to you [INAUDIBLE], later on, because I need to confirm this with our region in South Asia. I'm not 100% sure about how the Section 1 and 2 in Bangladesh works, but if you could leave it with me, I'll surely get back to you with detailed information on t his.

Venus Liao

Thank you. You might want to continue to the second question asking about any scholarship for this program in PSW.

Mahdi Shariatian

Well, I would like to mention that we do have a set of different scholarships. I'm not 100% sure what program [INAUDIBLE] is referring to. We have a set of different scholarship programs for our undergraduate and postgraduate programs.

The other thing that the team is working on is we're working on a set of new scholarships that will be letting the market know about in a few weeks. So watch this space at the moment. The current scholarships are between 10% to 25% for our undergraduate programs, and we do have a special 30% scholarship for our postgraduate programs in the faculty. So all the IT, Computer Science, Cybersecurity, Data Science, Engineering, Construction Management programs. Yes.

And PSW-- I believe that's Post-Study Work. So any students who complete to two years according to the current regulations will be eligible for a post-study work visa. Thanks, Venus.

Thank you, Mahdi. Chris, I might throw this question to you. Can you tell us the difference between ICT and computer science?

Chris McCarthy

Yeah, that's a great question. Yeah, there's always a large overlap to some degree. ICT is probably a more broad term. So Information Communication Technology is really the term referring to everything from the business end-- so business systems and how we use IT to solve business problems-- through to the software development side as well-- that technical side. And communications with respect to networks, and things like that. So ICT is really more a broader capture of the whole field of technology, if you like-- digital technology.

Computer science is probably a bit more about-- as the name suggests, it's a science, in the sense that it's looking at the study of how we use computers to solve problems. It tends to be more focused on algorithms, on we say data structures-- so that is the way we represent data in a computer.

And I guess it's looking at more that under-the-hood question of how do computers work? How do we make them work better to solve our problems? So a little bit more focused on the technical side. And also how we measure that-- how do you choose this algorithm over this algorithm? How do you know one is better than another? How do we determine that, because it could be speed, but it could

be other things like how much data it requires to do what it's doing, and things like this, or how much storage it takes up.

So computer science tries to probe a little deeper into the technical aspects of ICT. I hope that answers that question. It's always slightly tricky. There's a lot of crossovers between-- for example, even software engineering as well. Software engineering and computer science have a lot of crossovers, but computer science is more about, how do you solve problems? Software engineering is more about, how do you deliver products from software development? It's more about processes. But hopefully that's answered your question.

Venus Liao

Thanks, Chris. That's fantastic. It seems we have few online hitches. Continue to ask these questions about-- can you please advise about how much salary package a student can expect after getting a cybersecurity degree?

Chris McCarthy

Is this one for me?

Venus Liao

Ah yes, for you, Chris, if that's OK.

Chris McCarthy

That's really hard for me to answer, I think. I guess it would vary depending on the organization and the role, particularly, that you're in, because cybersecurity as a role is pretty broad. I might have to take this offline to find out some real numbers.

Mahdi Shariatian

May I jump in, Chris? So I just want to let you know, salaries in Australia depend on a lot of different things. So as Chris mentioned, it depends on the type of role, in terms of how much experience you bring to the role. But overall speaking, as a graduate entry to the field of IT, you're expecting around $58,000 to $65,000 a year.

But what I can tell you is actually what we are very proud of. Our graduates from Swinburne get paid relatively higher than the average graduate salary that is available to the students. But if you want to go into deeper, there are certain websites that you can use to compare the salaries and find out what range of salaries are setting forth for different roles. I suggest you to look at seek.com as well. It is around $58,000 to $65,000.

Venus Liao

Thanks, Mahdi and Chris. Just some of the questions around entry requirements, and also the intake for Semester 2. What will be the latest intake for bachelor's and master's programs, in IT and computer science I assume? Will July intake still take place? Mahdi, over to you.

Mahdi Shariatian

Yeah, thanks Venus. There's a lot of questions around that, and thanks for addressing it. I think that will be our last question to answer on this webinar. July intake will not happen is the way it is, currently, considering the current situation in Australia and in the whole world.

We are working very hard in the university to come up with a model that suits our students best, and can assure the quality of our teaching and learning experience. So given the time-- things are happening very fast in the world, and we are watching it very closely. In the next few days, we are going to have announcements on how and what will be the next intake.

But in terms of on-campus classes, I'm not 100% sure, and we don't have any information on that-- when that's going to go back to normal, and when the borders are going to open for students to come back. But any information-- any progress in that area-- we will surely let our agent channels and our students know about this.

Venus Liao

Thank you, Mahdi. We have a question about entry requirements for undergrad and postgrad for Indian students. I'll let Mahdi get back to you regarding this information, and also the IELTS requirement. We're just going to take one more last question before we close the webinar today. Mahdi, could you quickly touch base on the current scholarships available for Master of Cybersecurity, please?

Mahdi Shariatian

We do have a 30% flat scholarship for our Master of Cybersecurity, so any students who start now will receive a 30% scholarship. The entry requirement is easy. As long as the student meets the entry requirement and receives an offer, the scholarship will be placed in their offer letter.

I've got also another update quickly, before we finish up, on Bangladesh-- entry into our postgrad programs. We accept all Section 1 universities' undergraduate programs to our postgraduate programs, and we have a list of Section 2 universities that I'm happy to share with [INAUDIBLE], who has asked the question.

Venus Liao

Thank you, Mahdi. I want to thank everyone for joining us at the webinar today, and to Chris and Mahdi for participating as the panellists today. And that will bring us to the end of the webinar. We slightly went over time-- apologies for that.

I would just like to promote the next one. Coming up, a webinar will be on next Wednesday, 13th of May, on Swinburne Aviation and Piloting. The invitation will be sent out to all the agents today before COB, and we encourage you to register in advance for all the upcoming webinars on Swinburne's website, Information for Agents and Partners page.

Lastly, I just want to wish everyone a happy lovely weekend and a happy Mother's Day. Thank you, everyone. Thanks, Chris and Mahdi.

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