

S H A R I N G
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Featuring
Dr Henry Chan & Dr Stephen Chan



Interview with Dr Henry Chan

Dr Henry Chan joined COMP in 1998 after getting his PhD from the University of British Columbia (UBC), Canada and working in the industry for several years. His research interests include Networking and Communications, Cloud Computing, Internet Technologies, and Electronic Commerce.

I enjoy so much in teaching and nurturing students

Could you highlight your education background?

I received my BA and MA degrees from the University of Cambridge and my PhD degree from the University of British Columbia. Before starting my academic career, I acquired several years of industrial experience. I learn in different ways which help me see things from different perspectives.

Nowadays, learning is a life-long process, we keep learning throughout our whole life. Therefore, when we mention education, we are not talking about formal degrees, but about the learning process that we went through.

Could you share some of your memorable and remarkable learning, teaching, and research experiences?

I think that learning should not be confined to the classroom - students should have opportunities to learn outside the classroom. I enjoy teaching, nurturing students and exploring their potential. I gain enjoyable and satisfying experience when my students learn something new; I hope to take their learning a step further. In recent years, I have been striving to coach students in carrying out projects and participating in various competitions. During the past six years, my students have won over 30 awards.

Another memorable experience happened in about six years ago when I coached a student from our department who was one of the brightest students I have ever met. He could only type with two chopsticks, but he got first-class honours and won many awards. Unfortunately, he passed away a few years ago. Although his life was short, he achieved a lot. Life is how meaningfully you live but not how long you live, and that bright student demonstrated this saying. The student also

inspired me to develop something that are beneficial to society, that is why in recent years I have been involved in projects with disabled students. Without meeting some of the disabled students, I would not have had the chance to realize there has been another group of people in the world whom computing can help.

About six or seven years ago, I conducted an applied research project on radio-frequency identification, which received a significant amount of funding amounting to over HK\$4 million. It is one of the major projects that I worked on in this department. I collaborated with my research team and developed an interesting piece of software. Our team solved a lot of problems, and we won an international award eventually. From the project, I knew more about the Hong Kong air cargo industry, which has been ranked top in the world; it is one of Hong Kong's strengths as well. It was a good experience for me since I gained a great deal from the project.

The biggest satisfaction comes from my contribution to the research community and knowledge transfer to students





We have learned that your areas of research are in Networking and Communications, Cloud Computing, Internet Technologies, and Electronic Commerce. Could you tell us what inspired you to start working in these areas? And what gives you the biggest satisfaction when working on projects in these areas?

Previously, I worked at Hong Kong Telecom for several years, the job was related to networking and communications. After graduated from Cambridge, I was involved in the above areas and became interested in relevant research. Then, I did my PhD thesis on a topic related to these areas. In 2000, the department strived to offer e-commerce courses, I was engaged in developing the subject, and wrote a book about e-commerce. My work experience at Hong Kong Telecom in product development relating to the commerce helped me a lot. Two years ago, when cloud computing was still at an early stage, I started to learn cloud computing because of the IEEE Intercloud project.

I get the greatest satisfaction when I solve a problem or publish a paper since I have learned something new and can contribute to the research community. I believe every researcher has the same feeling as me. Indeed, I have two roles: one is teaching to convey knowledge, and another is engaging in research to create knowledge. Of course, creating knowledge gives me the greatest satisfaction. Teaching and research are inter-related, in that we keep creating knowledge and conveying it to students.

Could you tell us about one of your recent research projects and your expected deliverables?

I am going to start a new project on intercloud, an area that has a lot of potential, just like the Internet has had a huge impact on our daily life. I believe intercloud will also make a big impact on society in the future. Clouds can be connected to create an even more powerful platform than it is currently available. I am going to study architecture, protocol, and mechanism for clouds to interact, talk, and cooperate with each other. I believe it would be a challenging and interesting project.

I expect that we will develop a protocol, system, and architecture, as well as software for the clouds to talk with each other. These are my expectations in the next five to six years of focus on this

project.

Cloud computing is a new area that has started to become popular, especially in the business sector. It is changing the ways that people have traditionally been doing things. It is altering the ways that people enhance their business or providing a cost-effective means to run a business. A bigger impact will occur when many different clouds collaborate with each other. For example, you will be able to set up your own super computers with the help of clouds, and everyone can share their resources.



You have received numerous awards, such as three President's Awards and five Faculty Awards, and recently you were awarded the IEEE Computer Society 2015 Computer Science and Engineering Undergraduate Teaching Award. Did those awards have any impact on your work or personal life? Do you consider yourself a role model to others?

Over the past 15 or 17 years, most of the awards that I received have been relating to teaching, and I would like to share with you one word - "CARES". To support the department's education philosophy, I am developing a CARES model for teaching/education, which stands for Computing for

Application, Research, Entrepreneurship, and Service. Also, the CARES model means care in education, we can't teach well and students can't learn well without care. The four focuses of the CARES model correspond to four types of students. Most students belong to the application type, they apply computing

knowledge in a certain field and develop their career in the area after graduation. Research-oriented students engage in research work and continue studies after graduation. Research generally involves a more formal and systematic problem-solving process, including defining problems, developing solutions and performing evaluations - a process that focuses on innovation. Students in entrepreneurship set up their own businesses, identify and realize opportunities, and manage resources to accomplish certain business goals. Students in the area of service focus on serving others (i.e., giving rather than taking), it is very important to contribute to society because after all we are part of it. Education is to teach students not

only about technology but also how to be well-rounded. Therefore, I am glad that PolyU is introducing service-learning to teach students helping others with the use of technology and contribute to society.

I would not call myself a role model. Everyone has his or her own achievements, strengths, and weaknesses. I have my weaknesses and still have room for improvement as well. I always tell students the most important thought is how to explore their strengths and how they would like to contribute to society. If we appreciate a person's strengths, everyone can be a role model for everyone else. We should try to achieve more.

I am dedicated in further developing the CARES model for enhancing computing education

What is your plan of teaching/research in the next five years?

In the next five years, I plan to involve myself in research on cloud computing and networking. For teaching/education, I will do more fundamental research on the CARES model to help design the curriculum and extra-curricular activities that will be involved in computing education. Comments from colleagues and other people are most welcome.

The aim is to provide students with a well-rounded education. Nowadays, we don't just talk about teaching but about how to

help students to learn, which is far more important. Teaching well is, of course, important but we should take one step further to help students understand and explore their potential. We should encourage students to explore the areas of development that they have potential. In summary, in support of the department's education philosophy, I expect to do more research on the CARES model to enhance computing education in the next five years.

Can you describe your relationship with your students?

I treat my students like my sons and daughters. I think that it is the best way to show my care to my students and to make a big difference in education.





Interview with Dr Stephen Chan

Dr Stephen Chan joined COMP in 1993 and has been serving at the Office of Service Learning (OSL) since 2012. His research interests include Data Mining, Recommender System, Human Computer Interaction and Service Learning.

I truly believe that I have the obligation to contribute to the society. Service Learning can create impact on teachers and students as well as the society

Could you highlight your education background?

I was born and brought up in Hong Kong, where I attended primary and secondary school. Then, I went to the United States for university. I obtained my Bachelor, Master's, and PhD degrees all in the US. I am actually not a computer scientist. I have a Bachelor of Science degree in Electrical Engineering from the University of Rochester in New York. Then, I got a Master's Degree from the University of Wisconsin in Electrical and Computer Engineering. After that, I returned to Rochester for my PhD, also in Electrical Engineering. So my background is really mainly in Electrical Engineering with a little bit of Computer Engineering, rather than in Computer Science.

After I had received my Bachelor's Degree, I worked in the US for one year before I went back to graduate school to obtain my PhD. After I had received my PhD, I went to Canada to work for the National Research Council and a computer graphics company, but I didn't work in a university until I returned to Hong Kong in 1993. That was the first time I worked in a university. When I got my PhD, I obtained two or three offers from some Canadian universities, but I didn't accept them as I thought that I had been in universities for too long – about 10 years by that time – so I decided to go and work for industry and government.

Could you share some of your memorable and remarkable learning, teaching, and research experiences?

One thing that affected me a lot was going to the US to study. For me, that was quite a big transition because you don't really have many choices in Hong Kong as everything is well planned for you. I went to a high school where all of the subjects were decided for us. My only choice during secondary school was choosing between two technical subjects: electricity or mechanical stuff. After Form 5, I applied for Form 6, but then I had no choice but to study Physics and Mathematics. However,



when I went to the United States, there were so many things that I had to decide for myself. I chose to major in Electrical Engineering, at the same time, I was required to take a lot of other general education subjects. I ended up taking so many other subjects like Economics, History, Music, Art History, etc. That's one of the lessons that I learned – that I had a lot of freedom but at the same time I also had a lot of responsibilities to myself. If I chose certain things, I could not blame other people, since I had made those decisions carefully by myself. To me, education is something that you do for yourself – you are responsible for yourself. This is what I told my students, as they are also faced with making a similar decision like the one I made before. This is one of the most valuable lessons that I have learned since I have had to make a lot of decisions afterwards in my life.

There have been a lot of opportunities, yet I have had to be careful as well. I realize now that the choices I made were not always free choices – in many cases the decisions were

affected by my past experiences. For example, I am now the Head of the Office of Service Learning. It was obvious that I had to make a decision when this post was offered to me. If I did not take this position, I would have remained an academic in Computing and continued until I retired. I decided to take it at that point because I was very clear that I wanted to devote a large part of my life to service learning. The fact that I was offered this position was because of my many earlier decisions. I remember that when I first came to PolyU in 1993, I was teaching Computer Science, but I very soon got some opportunities to teach secondary school teachers in some workshops on how to design webpages. At that time, the Internet was just getting popular. It was a new technology. At the university we had access to this technology before the secondary school students did, so the secondary school teachers asked us to give them some training. So I made many small decisions along the way and, eventually, I made a major decision when I decided to take up this post of Head of the Office of Service Learning. Every time I made a decision I was only slightly conscious of the consequences.

The major turning point was in 2006 when we started holding workshops for students outside Hong Kong. Eventually, we took the service-learning projects further from Hubei to Gansu to Cambodia, Myanmar, Rwanda, etc. Those are some of the important experiences in both my learning and teaching career.



It is important to learn from mistakes rather than avoid them, and recover from the mistakes and look ahead

We have learned that your areas of research are in Data Mining, the Recommender System, Human Computer Interactions, and Service Learning. Have any incidents or people inspired you to invest your energies in these areas?

I learned one critical lesson when I was a research student involved in computer-aided manufacturing. My supervisor had bought a very big and expensive machine that could cut metal, and my task was to write a programme to run that machine. Because of my mistake I broke one of the cutters, which was really expensive. I felt really bad since I had messed up. I was really afraid when I talked to my supervisor, but then it turned out that he did not think that it was a big deal, although of course he felt bad. His comment was that I have to learn from that experience and not to be too worried about making mistakes. What was more important was that I had to learn to be more careful next time and not to make the same mistake in the future. That left a deep impression on me, and I knew that I had to maintain this attitude in my future life. We cannot expect that mistakes will not happen and that people won't do the wrong thing. However, it is important that we recover from these mistakes and not be broken by them, and that we look ahead. I now still maintain a good relationship with my supervisor. I am

still respectful to him and I still call him professor instead of by his first name.

Another experience that made an impact on me was in the national laboratory of Canada. I was sent to represent Canada in a committee of an international organization. Canada has a very small population, but in the committee all countries are equal and every country has a vote. Some countries sent many representatives, but since Canada has a very small population, most of the time I was alone and we did not have much voice during the development of standards. When it came to voting and deciding on whether the proposal should be accepted, I was the only vote from Canada so my vote was significant. I was so impressed that every country had only one vote, even if there were huge differences between them, such as between the US and Canada. What's more, I had cast a vote on behalf of Canada, even though I was not a Canadian, but was from Hong Kong and the holder of a British passport. What I learned was



that if you are good and are willing to work hard, you will have many opportunities and the world is wide open for you.

I had another experience a few years ago that also left a deep impression on me. It was around 2008-2009 when I started working with Dr Grace Ngai of our department. At first, we were developing interesting science camps, and then we hit upon the idea of developing a computer, by putting some electronics on shirts. The person wearing that shirt would be able to interact with a computer using those electronic sensors. It started as small skills summer camp in a community service project. At that time, we still did not have service-learning. The idea was quite innovative and we ended up including it in a new line of research. Finally, we published this research in the proceedings of a top conference. That also encouraged us to burrow deeper into human-computer interactions. So we learned that sometimes ideas come by chance. They are not planned, and we have to grab opportunities as they arise.

When I was in secondary school, I became interested in geometry. Later, when I became a research student, my first interest was in representing geometry in a computer, starting with two-dimensional and moving on to three-dimensional drawings. My thesis was on representing the geometry of

products and using the geometry to control machines. My PhD was not in a traditional area of electrical engineering, but more in automation. Later, I became more involved in representing data for other types of industrial data. My interests broadened, so when I came back to Hong Kong, I came to the Department of Computing instead of engaging in manufacturing engineering. Here, I started to become interested in databases and data mining, so I started becoming involved in these areas. Again, it was a case of one decision leading to another, and gradually I made small steps. It took me away from my original interest and, along the way I became more aware of the person who uses the computer, which generates the data. That is how I got into HCI. I had a PhD student who was doing research in a recommended system for tourism, so we studied different information. We discovered some data that looked unusual and we didn't expect that. We discovered that at least one of the major websites in China is engaged in a lot of manipulation so that a lot of data might not be real in that the comments and recommendations supposedly provided by users are not true. One of our speculations was that people create fake data to make the website look more popular. This is part of what we learned – that the behaviour of the people who use technology is much more important than the technology itself.

There are many opportunities out there and we have to grab them by ourselves



Could you tell us about one of your current projects and your expected deliverables?

I work closely with Dr Ngai and one of our current projects is affective computing. That involves developing ways for computers to recognize human emotions, for example, recognizing if the person is paying attention to the computer or is concentrating on the job, or is distracted or getting bored when using the computer. This project could greatly improve efficiency and is potentially useful in areas such as e-learning.



As you are the Head of the Office of Service Learning in PolyU and a firm believer of service learning, could you please share with us your insights on service learning?

The reason why I become a firm believer of service-learning is that, first of all, I came from a poor family. When I was in primary school, I had to start learning English, but there was no way for my parents to help me as they have a low level of education. But I got help from my father's supervisors, who spent time helping me to learn English. Later, when I was accepted into the secondary school, my family was too poor to afford the tuition fee, but I got a scholarship from the government and help from the Catholic school. Then, when I got into university, I got scholarships to help me to study overseas and also help from an American organization. Throughout my life, I would not have been able to receive an education without all the help that I received from different people. So I have a strong feeling that I got a lot of help from people and society and that I have the obligation to give something back. I feel strongly that our education is not just a personal matter – we got a lot of help from family, friends, and the government, which allowed us to come here to study. So I feel strongly that our students

should be more engaged with society so that they understand what society needs. They should not just think about their own career but also about what is good for society, particularly for the underprivileged. I can now truly see that service learning has had a really positive impact on both teachers and students. The more I get involved, the more convinced I am that this is good for students, teachers, the university, and society. From the response from our service targets and NGOs, I know that this is a good way to educate our students. It is not just about theories – it links learning with the world. To a great extent, we are fortunate that we live in Hong Kong, as we don't see real poverty with starvation and wars, and we have shelter. I think we do have an obligation to not just enjoy what we have, but to try to really make good use of it. What can we do for the world?

Coming back to the department, I think that it's amazing that Computing is playing such an active role in service-learning because it's rare for service-learning to be led by an engineer or scientist. The Department of Computing has contributed a lot to PolyU in service-learning. I think we have set a good example by showing many colleagues that service-learning is not only carried out by people in the social sciences. I think we have to strengthen the current situation – make it more international with different partners send students on exchange programmes related to service-learning and invite other universities to send students to come to Hong Kong to take part in our projects. We also want to do more research on service-learning as a teaching method, as we already have a few years of experience in the area.





For contributions and enquiries, please contact:
Ms Agueda Chau x4239
Ms Christine Liu x7274

Editorial Board:
Prof. Jiannong Cao
Ms Agueda Chau
Ms Christine Liu

Design:
Mr Anson Kwan

