



DEPARTMENT OF STATISTICS

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Message from the Chairlady

Dear Alumni and Friends,

2020 was a year fraught with challenges. Wearing a mask and maintaining social distancing have become the new normal. In view of the pandemic, the University has adopted online teaching, which has been implemented smoothly through the concerted effort of all colleagues to continue achieving the desired learning outcomes. I would like to take this opportunity to express my sincere gratitude to all colleagues for their support. The department pledges to forge ahead and continue to cater to the learning and teaching needs of our students amid these challenging circumstances.

Despite the difficulties we are facing, the department keeps moving forward. To provide a more enjoyable Web experience for our visitors, the department and programme websites have been revamped. Through these websites, you can obtain news and information about the department's events, achievements and programmes. We have also made promotional videos for the Statistics Programme, the Risk Management Science Programme and the Quantitative Finance and Risk Management Science Programme, which offer the public a holistic understanding of the features of the programmes and the career prospects of graduates.

To enhance the learning experience for students, the department has purchased more high-performance computers. The general office of the department has also been renovated and an interactive touchscreen has been introduced to provide information on the department's latest developments.

On the human resources front, several new faculty members have been appointed. Dr Chan Chun Man and Dr Cheung King Chau have joined the department as Lecturers, and Dr Han Ruijian and Dr Zhu Huichen have joined as Research Assistant Professors. More details about these faculty members can be found on p. 2. These appointments have further strengthened the research and teaching excellence of the department. Please join us in wishing them a warm welcome.

Sad news has reached us: Professor Lam Yeh, former Chairman of the Department of Statistics, passed away on 18 April 2020. On behalf of the department, I would like to express our deepest condolences to his family and pay the highest tribute to Professor Lam. We will always be grateful for his contribution to our department.

The threat of COVID-19 remains high and this is not the time to let our guard down. We must stay vigilant against this virus. In the meantime, I wish you and your loved ones a safe, healthy and prosperous year ahead.

Song Xinyuan
Chairlady

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Obituary

Professor Lam Yeh, former Chairman of the Department of Statistics (1997-1998), passed away on 18 April 2020. Professor Lam joined the department in 1984 and retired in August 1999.

The Department of Statistics would like to offer our sincere condolences to his family, friends and colleagues.

Advancement



Prof Fan Xiaodan advanced to Professor, with effect from 1 August 2020.



Prof Phillip Yam advanced to Professor, with effect from 1 August 2020.



Prof Lin Yuanyuan advanced to Associate Professor, with effect from 18 July 2020.



Prof Wei Yingying advanced to Associate Professor, with effect from 30 July 2020.

New Staff



Dr Chan Chun Man joined the department as Lecturer on 6 January 2020. Dr Chan obtained his MPhil in Statistics from The University of Hong Kong and his PhD in Applied Statistics from The Hong Kong Polytechnic University in 2008. Prior to joining our department, he served in the Department of Management Sciences at City University of Hong Kong.



Dr Han Ruijian joined the department as Research Assistant Professor on 11 August 2020. He obtained his BSc in Mathematics and Applied Mathematics from Sichuan University and then a PhD in Mathematics from The Hong Kong University of Science and Technology. His research interests include statistical machine learning, graphical modelling, high-dimensional inference and adaptive learning.



Dr Cheung King Chau joined the department as Lecturer on 3 September 2020. He obtained a BSc in Mathematics from The University of Hong Kong, an MSc in Statistics from The Australian National University, and a PhD in Statistics from The Chinese University of Hong Kong. Before joining our department, he served in the Department of Statistics and Actuarial Sciences at The University of Hong Kong.



Dr Zhu Huichen joined the department as Research Assistant Professor on 31 August 2020. She received a BSc in Statistics from Fudan University, an MSc in Statistics from The University of Illinois, Urbana-Champaign, and a PhD in Biostatistics from Columbia University. Her research interests include quantile regression and statistical machine learning.



Miss Yuki Yu joined the department as Project Coordinator on 1 April 2020.

Honours and Awards

Journal of Time Series Analysis Distinguished Author Award

Prof Chan Ngai Hang was awarded Journal of Time Series Analysis Distinguished Author Award in recognition of his significant contributions to the journal, based on publications appearing in Volumes 1-41 inclusive. For details, please visit: <https://onlinelibrary.wiley.com/page/journal/14679892/homepage/distinguished-authors>



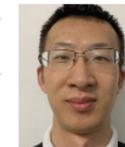
Congratulations to Prof Chan!

W J Youden Award in Interlaboratory Testing in JSM 2019

Prof Wei Yingying and her former PhD student Dr Luo Xiangyu (currently Assistant Professor at Renmin University of China) were jointly awarded the W J Youden Award in Interlaboratory Testing in JSM 2019 for their publication "Batch effects correction with unknown subtypes", Journal of the American Statistical Association, 114 (526) 581-594.

For further details, please refer to: <https://www.amstat.org/ASA/Your-Career/Awards/W-J-Youden-Award-in-Interlaboratory-Testing.aspx>

Congratulations to Prof Wei and Dr Luo!



Faculty Exemplary Teaching Award 2019

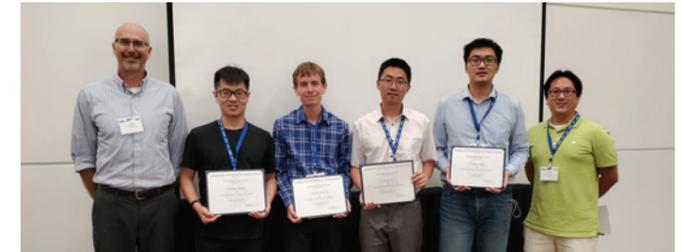
Prof Chan Kin Wai was awarded the Faculty Exemplary Teaching Award 2019 in recognition of his teaching excellence.

Congratulations to Prof Chan!

ASA Student Award 2019

Dr Song Fangda (Supervisor: Prof. Wei Yingying) was awarded the 2019 ASA Distinguished Student Paper for the Section on Statistics in Genomics and Genetics. The title of this paper is "Flexible experimental designs for valid single-cell RNA-sequencing experiments allowing batch effects correction".

Congratulations to Dr Song!



Recipient of To Cho Fong Statistics Prize 2019/20

Name	Major / Year in 2019-20	Amount (HK\$)
LI, Keqi	STAT / Yr 3	2,900

Recipients of CUHK Statistics Alumni Scholarship 2019/20

Name	Major / Year in 2019-20	Amount (HK\$)
YANG, Huaixun	STAT / Yr 1	10,000
LAM, Yuen Yung Audrey	RMSC / Yr 1	10,000
CHEUNG, Chun Yin	QFRM / Yr 1	10,000
YAO, Sicong	STAT / Yr 3	5,000
FENG, Yuxiao	RMSC / Yr 3	5,000
LAM, Chung Yin	QFRM / Yr 3	5,000

Recipients of Undergraduate Student Overseas Exchange Sponsorship Scheme

Name	Major / Year in 2019-20	Host Institution
CHAN, Sze Wing	STAT / Yr 3	Technical University of Denmark
CHEUNG, Man Ting	RMSC / Yr 3	Uppsala University
LAU, Chiu Tan	RMSC / Yr 3	KTH Royal Institute of Technology
LO, Wai Hang	STAT / Yr 3	Technical University of Denmark
MAO, Ruiqi	RMSC / Yr 3	University of Massachusetts, Amherst
MAO, Yanqi	RMSC / Yr 3	University of Toronto
XIE, Yu	QFRM / Yr 3	University of California, Berkeley
ZHOU, Jiabin	RMSC / Yr 3	University of Pennsylvania

Conference Support to Postgraduate Students

Name	Conference Details
HAN, Jinhui	CMStatistics 2019 during 14-16 Dec 2019
LIAN, Sheng	CMStatistics 2019 during 14-16 Dec 2019
LIN, Yiqi	CMStatistics 2019 during 14-16 Dec 2019
SUN, Rongqian	CMStatistics 2019 during 14-16 Dec 2019
TSANG, Man Yiu	The Quantitative Methods in Finance 2019 Conference during 17-20 Dec 2019
WANG Ling	The 10th Australasian Actuarial Education and Research Symposium during 28-29 Nov 2019
XI, Yiru	The Quantitative Methods in Finance 2019 Conference during 17-20 Dec 2019

Recipients of Department of Statistics Scholarships

Name	Major / Year in 2019-20	Amount (HK\$)
HUI, Wai Tung	STAT / Yr 1	10,000
NGAN, Yi Ho	STAT / Yr 1	10,000
LEUNG, Ka Yi	STAT / Yr 1	10,000
SIK, Kei To	STAT / Yr 1	10,000
YI, Jisoo	STAT / Yr 1	10,000
LUO, Junwen	STAT / Yr 1	10,000
LI, Chun	RMSC / Yr 1	10,000
CHEUNG, Chung Wai	RMSC / Yr 1	10,000
ZHU, Jiaying	STAT / Yr 2	2,000
WANG, Yaxuan	STAT / Yr 2	2,000
CHAN, King Yeung	STAT / Yr 2	2,000
WANG, Dingdong	STAT / Yr 2	2,000
XIAO, Jianbo	STAT / Yr 2	2,000
XU, Yuhua	STAT / Yr 2	2,000
LEE, Chak Ming	RMSC / Yr 2	2,000
CHAN, Ka Shing	RMSC / Yr 2	2,000
YAO, Sicong	STAT / Yr 3	2,000
HU, Fangxin	STAT / Yr 3	2,000
ZHANG, Aihu	STAT / Yr 3	2,000
QIN, Ruiyang	STAT / Yr 3	2,000
DENG, Rongchen	STAT / Yr 3	2,000
LO, Wai Hang	STAT / Yr 3	2,000
ZHOU, Jiabin	RMSC / Yr 3	2,000
MAO, Yanqi	RMSC / Yr 3	2,000
CHAN, Lok Yiu	STAT / Yr 4	2,000
FRISCELLA, Chelsea	STAT / Yr 4	2,000
MAK, Wing Keung	STAT / Yr 4	2,000
KUOK, Chio Ieng	STAT / Yr 4	2,000
KONG, Kai I	STAT / Yr 4	2,000
HUNG, Fan Hin	STAT / Yr 4	2,000
LI, Zeheng	RMSC / Yr 4	2,000
POON, Hiu Kit	RMSC / Yr 5	2,000

Recipients of Fan Fang Qi Yang Memorial Scholarship 2019/20

Name	Major / Year in 2019-20	Amount (HK\$)
LI, Wai Chan	STAT / Yr 2	5,000
LI, Keqi	STAT / Yr 3	5,000
LO, Tsun Ching	RMSC / Yr 4	5,000



Department Activities

Teachers and Postgraduate Students Interactive Activity

The department organized a barbeque party at the university on 9 November 2020, during which teachers and postgraduate students had the opportunity to mingle. Around 40 teachers and students enjoyed the barbeque amid the autumn breeze. ■



MSc Programmes

MSc in Data Science and Business Statistics

A luncheon was held at Cordis, Hong Kong on 28 June 2020. The event was attended by 76 participants, including alumni, students, teaching staff and supporting staff. Academic Excellence Awards were presented to eight graduates for outstanding academic performance. ■



MSc Risk Management Science

Academic Excellence Awards were presented to nine graduates for outstanding academic performance. ■



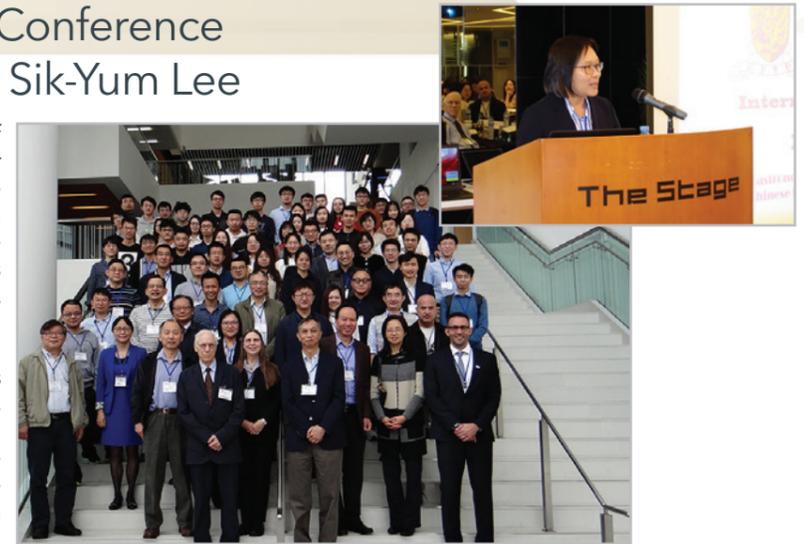
Collaboration with The University of Edinburgh

The Department of Statistics signed a Memorandum of Understanding on general collaboration with the School of Mathematics, College of Science and Engineering at The University of Edinburgh, UK. Prof Michal Branicki, representing The University of Edinburgh, visited the department on 6 November 2019. ■



International Statistical Conference in Memory of Professor Sik-Yum Lee

The International Statistical Conference in Memory of Professor Sik-Yum Lee was held on 17-18 December 2019. Prof Sik-Yum Lee was a leading statistician whose work had a tremendous and wide-ranging impact on the fields of psychometrics and statistics. The aim of the conference was to pay tribute to Prof Lee, whose ideas have never ceased to inspire academic researchers. More than 80 local and overseas participants attended the conference, at which 11 invited talks were given by renowned and distinguished scholars such as Prof Peter Bentler from the University of California, Los Angeles and Prof Jianqing Fan from Princeton University. Prof Isabella Poon, Vice-President of The Chinese University of Hong Kong, officiated at the opening ceremony and delivered a welcome speech to the conference participants. ■



Invited Talks

Name	Title
 Peter BENTLER University of California, Los Angeles	<i>S.-Y. Lee's Lagrange Multiplier Test in Structural Modeling: Still Useful?</i>
 Ana COLUBI Justus Liebig University Giessen	<i>On Some Functional Characterizations of (Fuzzy) Set-valued Random Elements</i>
 Jianqing FAN Princeton University	<i>Statistical Inference on Membership Profiles in Large Networks</i>
 Zijian GUO Rutgers University	<i>Group Inference in High Dimensions with Applications to Hierarchical Testing</i>
 Augustin KELAVA University of Tübingen	<i>Separation of Inter-individual Differences, Intra-individual Changes, and Time-specific Effects in Intensive Longitudinal Data using the NDLC-SEM Framework</i>
 E. J. KOTOGHIOGHES Cyprus University of Technology / Birkbeck, University of London, UK	<i>Computing the Best Subset Regression Model</i>
 Wai Keung LI The Education University of Hong Kong	<i>On a Matrix Factor Models</i>
 Marc PAOLELLA University of Zurich	<i>Financial Systemic Risk Prediction with Non-Gaussian Orthogonal-GARCH Models</i>
 Jian Qing SHI Newcastle University and The Alan Turing Institute	<i>Modelling Function-valued Processes with Non-separable and/or Non-stationary Covariance Structure</i>
 Ke-Hai YUAN University of Notre Dame	<i>Differential Item Functioning Analysis without A Priori Information on Anchor Items: Scree Plots and Graphical Test</i>
 Hongtu ZHU University of North Carolina at Chapel Hill	<i>Challenges in Analyzing Two-sided Market and Its Application on Ridesourcing Platform</i>

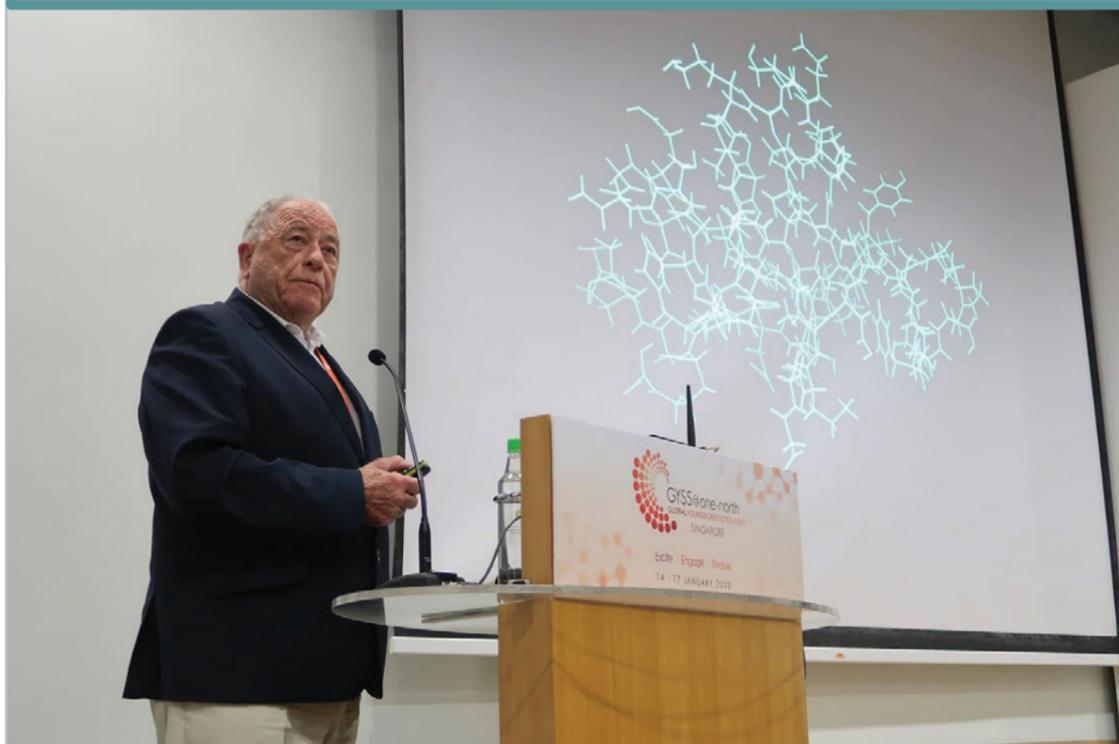




KENNEDY, Adrian Patrick
PhD in Statistics



It was my honor this year to attend the Global Young Scientists Summit (GYSS) 2020 in Singapore. The summit hosted many acclaimed researchers, among whom were field medalists and Nobel Prize winners. The summit consisted of three parts: plenary lectures, panel discussions, and small group sessions. In addition, the participants had many opportunities to socialize with researchers from a wide range of disciplines.



Sixteen distinguished scientists gave passionate lectures, discussing both their research accomplishments and their academic lives. The speakers represented a broad range of scientific fields, including physics, chemistry, mathematics, medicine and computer science, providing the participants with invaluable perspectives. The summit kicked off with a plenary lecture delivered by Sir Konstantin Novoselov, joint recipient, along with Sir Andre Geim, of the 2010 Nobel Prize in Physics. He spoke about the history, properties, and great promise of graphene. The discovery and isolation of a single free-standing atomic layer of carbon represent a major breakthrough in recent years, and the researchers' method, involving the repeated use of scotch tape, shows that even problems that have confounded the greatest scientific minds of the day can have elegantly simple solutions.

A speaker I found particularly interesting was Klaus von Klitzing, who was awarded the 1985 Nobel Prize in Physics for his discovery of the integer quantum Hall effect. He spoke of the

accidental nature of his discovery, and the subsequent resistance to it by major physicists of the time. His talk underscored the importance of basic research over applied research, a point that was strongly emphasized by fellow speaker John Hopcroft, recipient of the 1986 Turing Award. It is important to promote funding for researchers to pursue their interests, rather than just solving society's immediate problems, as this is how major breakthroughs are made. In addition, Klaus von Klitzing gave a most intriguing and informative talk on the redefining of the SI base units. He explained how the prototype of the kilogram and its secondary copies have been losing mass over time, resulting in variations between them. Hence, these base units are seen as inadequate for the increasing levels of accuracy that science demands. This problem was solved just last year by setting exact numerical values for several fundamental constants, from which the base units may be derived. This led me to reflect on which aspects of statistics rely on conventions chosen by pioneers centuries ago, and whether they might limit our way of thinking today.

By far the most interesting and engaging lecture was that given by Ben Feringa, recipient of the 2016 Nobel Prize in Chemistry, who created the first molecular motor. His talk emphasized the immense potential that science has yet to unlock and the amazing things that our bodies are capable of. His talk simultaneously impressed upon the audience the wonder of the natural world and how limited our understanding of it remains. He included the example of the first molecular car that he and his students developed. Despite the car's incredibly simple structure compared with its counterparts, the project lasted a decade and involved numerous doctoral students. Although the evolutionary process has been overcoming problems for billions of years, we have only just begun to scratch its surface, making the natural world an invaluable source of inspiration for researchers.



Between the lectures, I had the opportunity to meet with both of these speakers and also with fellow participants. It was a privilege to meet such a wide range of researchers and learn about the problems they are tackling. Amongst them was a medical researcher from Malaysia working on dengue fever, a Japanese researcher developing a synthetic nose, a German physicist from CERN and a Japanese physicist working on the detection of gravitational waves. Every participant I met was fascinating to talk with.



I am extremely grateful to have had the opportunity to attend the GYSS 2020 and make many new friends from around the world. The guest speakers offered many personal and academic insights that I hope will help me grow as a person and aid my future research. Given the interdisciplinary nature of statistics, I feel that this experience was particularly insightful, as it is important to understand the problems faced by different fields before further developing statistical techniques. ■



CHAN, Sze Wing

BSc in Statistics
 Technical University of Denmark, Denmark

The Technical University of Denmark, also known as DTU, is one of the leading technical universities in Europe. Founded in 1829, the school was Denmark's first polytechnic, and offers mainly science and engineering courses for both undergraduate and postgraduate students. DTU has initiated a facility called Skylab, where students can seek help to develop their early stage ideas into business opportunities and make product prototypes with assistance from experts in the community, such as researchers and corporations. Located in Lyngby, 12 kilometres from Copenhagen, Denmark's capital city, students from DTU can easily reach north and central Copenhagen by bus or bike.

During my exchange at DTU, I enrolled in computer science courses related to AI, databases and statistics, all of which were Master level courses at DTU. Whereas students at CUHK usually have a relatively flexible timetable, course lectures at DTU are held once a week and usually last two to four hours, depending on the credits of the course itself, along with two to four hours of tutorials. Students can only attend a maximum of two courses per day at DTU. Most of the courses I enrolled in were related to mathematics and programming, and during tutorials students are expected to do exercise questions and discuss freely with friends and TAs. Most courses at DTU assess students' understanding through group projects and exams rather than individual assignments.

I also encountered some challenges during my exchange experience. Unfortunately, many exchange students were told to leave Denmark and return to their home countries due to the coronavirus. The university was forced by government instruction to shut down for a week and switch to online teaching. Despite the chaotic situation, the staff at DTU still cared a lot about the exchange students. They did everything they could to help these students to continue their education after they left Denmark and make special exam arrangements due to the differences in time zones. As most of the courses I enrolled in at DTU were Master level courses, I sometimes struggled to understand the content, as I lacked some of the background knowledge which was not taught at CUHK. Luckily, I met some very friendly Master students at DTU who patiently coached me during their free time and helped me catch up with the class schedule. Last but not least, the language barrier was a challenge during my exchange. As English is not an official language in Denmark, most signage and packaging are in Danish or Swedish only, as these two languages are very similar. When I first arrived I could not understand anything when I went to the supermarket, tried to read signs or went out with friends. But after a few months, I started to pick up simple words such as jordbær, which means strawberries, and kartoffel, which means potatoes. It was a very interesting experience for me to live abroad and overcome a language barrier. ■



CHEUNG, Man Ting

BSc in Risk Management Science
 Uppsala University, Sweden

On 17 January 2020, I embarked on my journey to Uppsala University in Sweden. Despite having learnt about and been in touch with the outside world through the internet, I had never actually visited a Western country. Sweden is one of the Nordic countries, and the concepts of gender equality, environmental friendliness and social responsibility are everywhere. I still remember the amazement I felt when I heard that it is common for man to be a stay-at-home dad and that it could be considered impolite for a man to hold the door for a lady. There were second-hand shops and zero-waste apps everywhere. Students from nearby countries had spent an extra twenty hours getting to Sweden by taking an expensive train instead of flying just to be environmentally friendly and responsible to our planet. You first experience these tiny details, and as they accumulate, you gradually realise the amazing cultural differences. I visited many cities and museums, and I started reading European history to get to know more about the places I had seen. Uppsala University has many exchange students, which allowed me to cultivate a sense of global citizenship by making friends from all around the globe.

Academically, I studied Multivariate Analysis, Time Series and other subjects, and I lived in a student hostel with a shared corridor. The lessons were not very different from those in Hong Kong, but I enjoyed how practical they were because we were asked to complete real time series analysis projects in the assignments. I feel that I learnt much more from undertaking these step-by-step projects than I did from the lectures, as they built up a map of connections in my brain and helped me to really absorb what I studied.

Overall, my journey to Sweden was way beyond my expectations. I was worried that it would be a boring country without many activities, but I found that, although it might not have the huge shopping malls and convenient lifestyle of Hong Kong, the harmonious and simple lifestyle in Sweden is so comfortable and relaxing. It really was a very pleasant journey. ■



XIE, Yu

BSc in Quantitative Finance and Risk Management Science
 University of California, Berkeley, USA

I went on exchange to the University of California, Berkeley. As my major at CUHK is Quantitative Finance and Risk Management Science, I took statistics and business courses at UCB, such as Stochastic Processes, Time Series and Investment. I learned a lot there, not only the course material, but also a new attitude towards learning. The students there are so proactive that they frequently interact with their professors in class, which is less prevalent at CUHK. After I returned and started the new semester, I have managed to interact more with my lecturers, which have helped me to learn more effectively and deepened my relationships with them.

Through this exchange experience I developed a goal: I am determined to pursue a Master degree at a top graduate school in the United States after graduating from CUHK. After that, I will try to find a job in the field of finance. I believe that being exposed to a different culture and getting to know different people in your early twenties is never a bad idea.

At the very beginning of my exchange, however, I experienced a disheartening time. I found my peers extremely talented and hardworking, and I was shocked by their strong ambition and drive. Later on, I overcame my negative feelings and learned the most precious lesson of all: to stop comparing myself with others and compare myself only against my past. Since then, I have maintained a healthy outlook.

I really appreciate having had this exchange opportunity. It not only introduced me to a different study mode and lifestyle, but also widened my horizons and deepened my thinking. I am thankful that our university and department provide us with such valuable opportunities. ■





DENG, Rongchen
BSc in Statistics

Census and Statistics Department



tough time understanding the relevant techniques, such as word embedding and Siamese networks, and applying the Python packages to the shipping data. Thankfully, my supervisor was patient and willing to give advice when I encountered difficulties. I finally managed to break the task down into pieces and gradually learn the related processes. I also conducted desk research on different models for measuring text similarity to establish whether records match. Under the guidance of the faculty supervisor, Prof Lin, I gained insight into how statistical methods can be applied across diverse fields. I greatly appreciate the freedom Prof Lin allowed me to explore the topics that interested me, and his suggestions throughout the process.

I was very pleased to be assigned to the Trade Statistics Processing Section of the Trade Statistics Branch (2), supervised by Ms Ng. This section mainly collects and analyses import/export declarations and cargo manifest records. I was responsible for using deep learning methods to help match import/export declarations with electronic cargo manifests.

I gained a lot from this internship experience. Through dealing with real-world data and experiencing how crude the data were, I changed my mind about data pre-processing. In addition, I honed my problem-solving skills and applied the knowledge I had learned to gain a deeper understanding of the issues. Through this programme, I gained a glimpse of the working environment and was fortunate to work under two supportive supervisors, along with a wonderful group of colleagues. I am grateful to have had this opportunity to join the department's Summer Internship Programme. ■

I welcomed the adventure of exploring deep learning and natural language processing. As I lacked knowledge of deep learning, Python packages and trading data, I initially had a

LEUNG, Hoi Ching
BSc in Risk Management Science

Census and Statistics Department



research papers presented at these events by participating professors from international universities. The topics covered different aspects of microdata usage, such as microdata generation, protection and dissemination.

During these two months, I became familiar with the microdata access schemes available in advanced economies such as the UK, Canada and the Netherlands. I was amazed by the variety and convenience of some of these schemes, which provide great flexibility and utility for researchers while simultaneously ensuring data confidentiality. After my research, I had a more thorough understanding of current developments and the tools available to perform SDC on datasets. My supervisor also introduced me to Hong Kong's current policy and the ways that confidentiality issues are addressed. There is more to be done to promote data utility and support academic research in Hong Kong.

During my internship at the C&SD, I was honored to be assigned to the Technical Secretariat Section, a special section that performs ad hoc tasks and provides technical support. My main duties were to conduct research on the comparison of various microdata access schemes provided by the national statistics offices of advanced economies. "Microdata" in this context refers to the individual records of households or businesses, which are very useful for research, but raise concerns about confidentiality. Eurostat and UNECE hold a biannual international conference on statistical confidentiality and statistical disclosure control (SDC), and I was required to summarize the key issues in the

This internship expanded my understanding of statistics, particularly the practical aspects. Although I had learned the basics of data analysis and hypothesis testing at school, most of this was detached from real world constraints. There are many controls that the government must implement before providing statistics and datasets, which data users like us are often not aware of. I was lucky to gain a glimpse of the operation of the C&SD and explore the work it does. I also met great supervisors and colleagues who gave me plenty of guidance and support during my internship. This will certainly remain an unforgettable experience in my university life. ■

NG, Siu Yan
BSc in Statistics

Census and Statistics Department



One of my major tasks was to manage a large database by creating a new user interface in Microsoft Access. To complete this task, I had to learn to use Access VBA and SQL, which were completely new to me. At first, this was quite challenging, as my weakness lies in programming, and I had to learn these languages on my own. However, with the assistance of colleagues, I adapted to the programming work. I was also assigned a research job that involved collecting and summarizing information to serve as a quick reference for survey interviewers during the data collection process. From these tasks, I learned not only new programming skills, but also how the Science and Technology Section processes various surveys.

I also gained a lot of knowledge from my supervisor at CUHK, Professor Fang Xiao. I was required to analyze a dataset on COVID-19 in Hong Kong to estimate and predict the number of daily cases. Although I found this difficult, by following my supervisor's instructions I was able to complete the task and write a report on the foundations of the data analysis. This helped me to gain a deeper understanding of statistical techniques.

The Professional Attachment Programme is generally very good. This programme offers an ideal opportunity for students who want to gain more working experience and understand the work of the C&SD. ■

For this internship programme, I was assigned to the Science and Technology Section of the Census and Statistics Department (C&SD). This section mainly collects statistics that reflect public technology usage and the status of innovation in Hong Kong.



WANG, Dingdong

BSc in Statistics

Census and Statistics Department

I am grateful to have been given the valuable opportunity to work as an intern in the C&SD. I was assigned to the National Income Branch. This section mainly deals with external merchandise trade statistics but also conducts customer opinion surveys.

The work experience gave me a taste of what the real work of a statistician is like. Over my two-month internship, I was responsible for nowcasting Hong Kong's GDP using information from search engines. Through reading a lot of material related to nowcasting and forecasting, and collecting a basic knowledge of macroeconomics, I learned a lot about how to apply statistics in economics. With the guidance of my supervisor, I finally built a nowcasting model and designed an automation programme in R language using Google Trends data as the main data source. Through these real-world tasks, I not only consolidated the knowledge I had mastered at university, but also recognized the appeal and importance of statistics.

My supervisor Chan Kin Wai was very supportive and introduced me to the project he was currently working on. I acquired substantial knowledge and matured a lot while undertaking this research. During this process, I was mainly responsible for single and multiple imputation analysis based on the notion of data depth. This was a major challenge for me, but with my supervisor's patient guidance, I was kept on the right track and eventually completed the task. The challenge of entering the unknown, learning R code from scratch to create the algorithm, and having to read a lot of relevant statistical knowledge brought me plenty of surprises and a sense of achievement.

Overall, this was a precious opportunity and an enlightening experience, and I greatly appreciate the efforts of the Department of Statistics to make this internship possible.

ZHANG, Qianhua

BSc in Quantitative Finance and Risk Management Science

Census and Statistics Department

This summer I worked at the Labour Statistics Division of the C&SD. I was responsible for finding and comparing alternative seasonal adjustment methods during the COVID-19 period. I encountered various difficulties during this research project. For example, it took substantial effort to learn the X-12 ARIMA software (the software in use at the time by the C&SD to conduct seasonal adjustment). I identified two alternative software systems from a literature review and compared their performance by running simulations using R. Finally, I completed this research project with a 20-page report and a recommendation to the C&SD for an alternative to provide better seasonal adjustment.

I consolidated my research skills through the literature review and strengthened my coding skills by implementing models using R and X-12 ARIMA. The research and analysis process also pushed me to pick up new skills, such as running a pivot-table for data analysis and using the "ggplot2" library in R for the data visualization. I am grateful to my supervisor, Eddie, who gave me excellent guidance and also career advice. I also appreciated the help of my colleagues.

I also worked with Prof. Wei this summer as a research assistant and was responsible for conducting literature reviews in two areas: simulated annealing and parallel tempering. As these topics were both completely new to me, I spent a large amount of time learning the concepts and theories. As I understood more about the theories, I could follow the literature in greater depth and express the findings in my own words. Writing literature reviews also honed my skills in academic writing. In the process, I familiarized myself with the common text editor LaTeX. At the end of the programme, I wrote code to implement a parallel tempering MCMC algorithm for a high-dimensional mixture model (given in a journal article). This further enhanced my understanding of parallel tempering and strengthened my programming skills. I am most grateful to Prof. Wei for guiding me and providing me with advice during the research process.

All in all, I gained work experience both as an employee at C&SD and as a researcher on campus. My exposure to various research projects and to working independently helped me develop a wide range of transferrable skills and broadened my horizon in statistics. I am grateful for this opportunity provided by the Statistics Department and the support rendered along the way.

MA, Zhijie

BSc in Statistics

Centre for Clinical Research and Biostatistics

I am very honored to have been selected to serve as a Junior Research Assistant at the Centre for Clinical Research and Biostatistics (CCRB) this summer. Working with Prof. Benny Chung Ying Zee, the director of the CCRB at the JC School of Public Health and Primary Care, along with his team, was a very meaningful and enjoyable experience.

During this internship programme, I was asked by Prof. Zee to construct a new search engine based on the Aims academic paper database of CUHK to improve the search performance of Aims. After a discussion with Mr Steven Yuk Fai Lau of the Research Association at the CCRB, I decided to build this new search engine in Python.

I first set up a MySQL database, and then used the Scrapy crawler framework to crawl the pages of CUHK's Aims database, and save them to the newly built MySQL database. At the same time, NLTK was used to segment the keywords and the content of the paper. The code had to ensure that phrases in double quotation marks were not segmented but rather searched as a whole, consistent with the rules of the Google search engine.

I then chose the BM25 algorithm in the Gensim package to calculate the correlation scores and sort them in reverse order to display the paper information most closely related to the search keywords typed by the users. Finally, I used Python's lightweight Web application framework, Flask, and deployed the search engine to the cloud server. This search engine realized the combined retrieval of paper title, abstract and author through a new correlation algorithm. It also realized the pagination function in the search results.

In these two wonderful months, I gained a great deal of knowledge that I had not previously learned in class. My self-learning ability was greatly improved, especially in computer programming. What impressed me most was the friendliness of the CCRB staff, who provided constructive suggestions, both work-related and more, which greatly benefited me. In particular, Dr Jack Lee and Mr Steven Yuk Fai Lau gave me a clearer understanding of my current work and future study plan. I am very grateful for their help and advice.

In addition, I would like to thank Professor Lin Yuanyuan of the Department of Statistics, and Benny Zee and Ms. Maria Ming Po Lai of the CCRB for their help and support during my internship programme, which enabled me to successfully complete my work despite the COVID-19 epidemic in Hong Kong.

Through this programme, I now know how to learn more effectively and have also greatly improved my learning ability in fields I was not familiar with or even aware of. I am very grateful to the Statistics Department and the CCRB for providing me with this excellent experience, which will be really helpful to my future studies and career.



XING, Qianyu
BSc in Statistics

Centre for Clinical Research and Biostatistics

Working at the CCRB as a Junior Research Assistant was an inspiring experience. I was honored to work with Professor Zee and the CCRB staff, who provided helpful guidance on my real-world project and encouraged me to learn to use productivity tools.

My first task was to organize the questionnaire information which had been collected by colleagues. I had seldom worked on raw data before, as my homework had usually provided cleaned datasets. I recognized that every record was precious, and became more cautious when cleaning data. I also noticed that I was weak in reading the handwriting of others, which required strengthening to become an effective team member. The second task, analyzing and writing a report, was my first project aimed at helping others. I struggled at first because I was somewhat limited by the analytical skills I had learned from courses and I attempted to apply statistical learning methods during the early stage. Professor Zee helped me to understand that the project should start with a simple description and summary, then progress to potentially answerable problems of scientific interest. My progress became smoother after I completed a research plan with selected problems. During the project, I read related papers to learn their analysis methods and reporting style.

Regrettably, I only worked in the office with my respective colleagues for seven days due to COVID-19. However, I appreciate that this internship helped me adapt to working remotely. As Ms Lai suggested, I made short PowerPoint slides to help present my ideas during Zoom meetings, and updated my progress by email whenever I had new observations to share.

It was a pleasure having the opportunity to work at the CCRB through the department's Summer Internship Programme. During this internship experience I realized both my strengths and my weaknesses, gained an introductory view of the application of statistics, and optimized my career planning.

AU, Yui Ki
BSc in Risk Management Science

New Media Group



During the internship, I was required to complete three main tasks. The first was to study the performance of the recommendation engine and propose a way to improve the algorithm. My second assignment was to optimize the article length for different business units. After collecting the completion rates of different articles and running an analysis to understand the current article performance, I had to propose an article length for different business units to improve the overall completion rate. My final task was to improve the click-through rate of the app push notification. I ran a multivariate regression analysis to find out how different factors, such as time, frequency and topic, affected the click-through rate, and made some suggestions based on the results. These three tasks allowed me to apply the theories I had learned in lectures to real-life scenarios, which provided a great opportunity to improve my practical statistical skills.

I would like to express my gratitude to the Department of Statistics and New Media Group for offering me this internship opportunity. I enjoyed my work at the New Media Group, and my colleagues were very friendly. I also learned a lot from this internship programme. In addition to practical statistical skills, my presentation and problem-solving skills improved greatly. I believe this real-life work experience will prove very helpful in my future career.

I was grateful for the opportunity to work as an intern at the New Media Group this summer, where I gained valuable experience. I was assigned to the Web and Application Platform Team, which is responsible for the company's IT and database management.



CHAN, Yik Hung

BSc in Risk Management
Science
UBS AG

It was my great honor to join the Industrial Placement Program (IPP) at UBS AG last year. During this one-year internship, I was involved in many different projects to automate and improve processes throughout the trade lifecycle. I played different roles in these projects, including that of a business analyst, a developer and even a project manager overseeing the progress of the projects. Majoring in RMSC helped me greatly in this internship, especially in terms of hard skills and financial knowledge.

In terms of hard skills, the advanced courses enabled me to develop my programming muscles. Because coding is required for derivatives pricing and simulation in some courses, the training in Excel VBA and R enabled me to perform my tasks in the internship. The machine learning and data analysis courses also helped me acquire both the theoretical knowledge and practical skills to process large amounts of data.

In terms of financial knowledge, RMSC courses provided me with a deep understanding of various kinds of financial products and exotic derivatives, rather than merely descriptive financial knowledge. For instance, CBBC (Callable Bull/Bear Contract), Variance Swap and other 'real-world' products were covered in these courses. Although stochastic calculus and the pricing of exotic derivatives might not have been much use in my internship work, studying these topics helped me to understand the nature and the background operations of these structured products. Surprisingly, these lessons facilitated my adaptability at the bank and smoothed the process of developing automation and process improvements.

Overall, this one-year internship gave me a glimpse of real-world practices and an opportunity to transfer what I have learnt in the RMSC courses to the workplace. Again, I am most grateful to UBS AG and the Department of Statistics for this opportunity and for their support.



DUAN, Yao

BSc in Risk Management
Science
HSBC

For the first half of 2019, I had the opportunity to work for the Credit Risk Analytics team at HSBC (Hong Kong).

It was truly a challenging but rewarding journey, where I had the chance to learn and even implement the currently in-use credit risk models, such as the Probability of Default model. During the six-month internship, one of the largest projects I participated in was to develop an interactive R program that incorporates the risk models and visualizes the computational results of the targeted models. It provided me not only with good programming training but, more importantly, with much valuable hands-on experience in real-world financial data analysis and modelling problems. These experiences helped me to both reflect on my past learning and look towards possible future careers. Through frequent discussions and collaboration with team members, I also developed a certain workplace skillset that includes task prioritization and efficiency in email communications. Last but not least, I feel rather fortunate to have met such lovely team members, who took great care of me and treated me as a close friend during the whole internship. They would always be there to support me whenever I was in need.

To secure such a job placement, our RMSC programme played a crucial role. The integrated curriculum means that we are exposed to many different fields, such as Statistics, Finance, and Computer Science, that are all related to the topic of quantitative finance and enhance our understanding of the topic from different perspectives. During the technical interview session, I had a nice discussion with one of the managers that covered various subjects, such as coding, regression modelling and VaR forecasting, most of which had been covered in previous RMSC courses. Moreover, my former colleagues reported that our programme has a very good reputation among big employers such as HSBC, especially when hiring for quantitative positions. This is a positive sign that we RMSC students are well positioned to secure our desired jobs upon graduation.

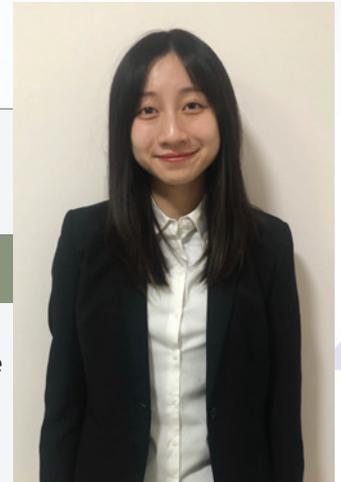


SHI, Grace

**BSc in Quantitative Finance
and Risk Management Science
HSBC**

As a co-op student trainee in unsecured lending risk at HSBC RBWM, I was tasked with designing an ad-hoc report template on SAS for a critical metrics analysis (payment ratio, delinquency rate, credit utilisation, etc.) of various Asia Pacific countries during the period of the Covid-19 pandemic. I was also tasked with consolidating on waterfall for proactive cross-selling, limit assignment strategy, and Covid mitigation measures and relief programmes.

My internship at HSBC gave me experience of using a wide array of updated methodology and application tools within a retail bank, including identification, measurement and mitigation of credit risk, especially for unsecured products (i.e. credit cards, personal instalment loans).



SO, Natalie

**BSc in Quantitative Finance
and Risk Management Science
Ernst & Young**

I joined EY as an intern in the financial risk advisory department. I participated in a project related to interest rate risk in the banking book, which was tasked with helping a client develop statistical behavioural models using the SAS platform to estimate parameters such as the monthly prepayment rate and early withdrawal rate. I was assigned to handle a variety of tasks. For example, I assisted in model development learning on the SAS platform and VBA programming. I had the opportunity to pitch our models to our client, which improved my presentation skills. In short, I think the internship experience at EY was very good.



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香港中文大學統計學系
Department of Statistics
THE CHINESE UNIVERSITY OF HONG KONG

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