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## Message from the Chairman

Dear Alumni and Friends,

It is my pleasure to extend heartfelt greetings to readers of the 11th issue of the departmental newsletter. I hope you will enjoy reading about the latest achievements and developments of the department.

2016 was a fulfilling and productive year. It gives me an immense sense of happiness and honor to announce that with concerted efforts of our colleagues, the 4th Institute of Mathematical Statistics - Asia Pacific Rim Meeting (IMS-APRM) was successfully held from 27 June to 30 June 2016. Over 600 participants from various countries joined the 4th IMS-APRM which provided an excellent forum for scientific communications and collaborations for the researchers in Asia and the Pacific Rim, facilitating academic exchange in the field of Statistics. To know more about this event, please turn to P.4.

To strengthen cohesion among our alumni and welcome the 30th cohort of graduates, the Alumni Association of the Department organized "30 Year Reunion" Dinner on 3 June 2016 at Happy Valley Racecourse. More than 200 alumni graduated in different years gathered in the reunion dinner in celebration of the thirty years of the department and it was our honor to invite Vice Chancellor, Professor Joseph J.Y. Sung to give his address for the dinner. We all had a memorable time filled with joy and jubilation.

Apart from the reunion dinner, The Alumni Association also established "CUHK Statistics Alumni and Mentors Scholarship" of which the objective is to award students with outstanding academic performance which can encourage our students to continue pursuing their studies with great effort. I am delighted to see our alumni are in full support of our department. Besides the above scholarship, Prof. Gu Ming Gao donated one million dollar to The Chinese University of Hong Kong for the establishment of "Fan Fang Qi Ying Memorial Scholarship" and "Fan Fang Qi Ying Memorial Bursary" offered to undergraduate students of our department. I would like to take this opportunity to express my sincere gratitude to Prof. Gu and those who made donations to our department. For details, please turn to P.3.

In addition, please join me in welcoming our new faculty member Dr. Fang Xiao. With his expertise in the area of statistical theory and methodology, the department's research profile will be further strengthened. To know more about him, please turn to P.2. I am also pleased to let you know the promotion of our faculty member: Dr. Yau Chun Yip has advanced to Associate Professor with effect from 11 August 2016. Let me send my hearty congratulations to Dr. Yau.

You may also wish to know that in Research Assessment Exercises (RAE), our department is ranked the best-performing department in CUHK substantiated by the highest score of the Research Funding Index.

We are looking forward to another year of significant achievements and developments. With continuous support from you and our staff, the department will have another great year ahead.

I wish all of you a healthy and rewarding Year of the Rooster!

Qiman Shao  
Chairman





**Professor Yau Chun Yip** has advanced to Associate Professor with effect from 11 August 2016.



**Dr. Fang Xiao** has joined the Department as Assistant Professor since 1 August 2016. He graduated with a B.S. degree in Mathematics at Peking University and got his Ph.D. in Statistics from National University of Singapore. Dr. Fang's research interests include statistical theory and methodology. Before joining our department, he was an instructor in National University of Singapore.

**Miss Yanny Ng** has joined the Department as Project Coordinator since 9 May 2016



**Vice-Chancellor's Exemplary Teaching Award 2015  
Faculty Exemplary Teaching Award 2015**

**Professor Wong Hoi Ying** was awarded the Vice-Chancellor's Exemplary Teaching Award 2015 and the Faculty Exemplary Teaching Award 2015. The VC's Exemplary Teaching Award is a prestigious award that is presented annually to outstanding teachers of the University, one from each of the eight Faculties and the General Education programme. The awardees' achievements in teaching are considered by their peers and students to be of the highest order. This award was presented at the 81st Congregation scheduled for 17 November 2016. Congratulations to Professor Wong!

**Best Teaching Assistant Award 2015-16**

**Miss Feng Menglu and Mr. Tang Sheung Ho** were awarded the Best Teaching Assistant Award 2015-16 in recognition of their outstanding teaching duties. The prize presentation ceremony was held on 6 September 2016. Congratulations to Menglu and Sheung Ho!



**Award of 2015 Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM)**

QFRM student **XI Yiru** participated in CUMCM with two teammates and was awarded the first prize for the outstanding performance. CUMCM is an annual national competition commencing from 1992, and is one of the largest mathematical competitions in modeling. Congratulations to Yiru!

**Overseas Research Award for PhD students**

The recipients of the Overseas Research Award 2015-16 were **Miss Lai Yingying, Mr. Luo Xiangyu** and **Zhang Zhuosong**. They respectively undertook research at the Imperial College London, UK, Yale University, USA and Stanford University, USA.

**List of Recipients of Advantage Trust Statistics Scholarship**

Name of Awardee	Major / Year in 2015-16	Amount (HK\$)
CHAN Wing Tung	STAT / Yr 1	10,000
CHEUNG Siu Fung	STAT / Yr 1	10,000
HO Ka Hang	STAT / Yr 1	10,000
LAM Chui Pik	STAT / Yr 1	10,000
LEE Ying Kin	STAT / Yr 1	10,000
LI Tsz Hei	STAT / Yr 1	10,000
TSE Kwan Nok	STAT / Yr 1	10,000
YUEN Chun Wing	STAT / Yr 1	10,000
CHUK Ka Lok	RMSC / Yr 1	10,000
NG Wing Shing	RMSC / Yr 1	10,000
DONG Zheungyuan	STAT / Yr 2	2,000
LIN Yuhang	STAT / Yr 2	2,000
MAO Yusang	STAT / Yr 2	2,000
NG Ming Hin	STAT / Yr 2	2,000
PENG Zhichao	STAT / Yr 2	2,000
ZHAO Yiming	STAT / Yr 2	2,000
CHAN Ho Ting	QFRM / Yr 2	2,000
LEUNG Chi Shun	QFRM / Yr 2	2,000
YU Ching Ting Alexander	QFRM / Yr 2	2,000
TSANG Man Yiu	RMSC / Yr 3	2,000
CHUNG Wing Ham	STAT / Yr 4	2,000
DAI, Zhenwei	STAT / Yr 4	2,000
DONG Xiaojing	STAT / Yr 4	2,000
HO, Chi Yeung	STAT / Yr 4	2,000
WONG Chun Wai	STAT / Yr 4	2,000
YUEN Wing Yan	STAT / Yr 3	2,000
CHEN Kexin	RMSC / Yr 4	2,000
NG Chung Yuen	RMSC / Yr 4	2,000
WONG Pak To Paco	RMSC / Yr 4	2,000
ZHUANG Yalin	RMSC / Yr 4	2,000

Name	Destination	Period	Total Award Amount (in HKD)
LAI Yingying	Imperial College London, UK	7 Mar to 20 May 2016	\$28,709.67
LUO Xiangyu	Yale University, USA	1 Jul to 30 Sep 2016	\$32,000.00
ZHANG Zhuosong	Stanford University, USA	1 Jul to 31 Aug 2016	\$26,000.00

**Conference Support to Postgraduate Students**

Student Name	Conference Details
CHEN Junyao	2015 Quantitative Methods in Finance Conference, Sydney from 15-18 December 2015
LAI Yingying	2015 Quantitative Methods in Finance Conference, Sydney from 15-18 December 2015
XIAO Shiyu	2015 Quantitative Methods in Finance Conference, Sydney from 15-18 December 2015
LI Yuanbo	Time Series Econometrics Workshop, Sanya from 18-20 December 2015
DONG Fangyuan	2016 Congress on Insurance: Mathematics and Economics, Atlanta from 24-27 July 2016
KANG Kai	22nd International Conference on Computational Statistics, Oviedo from 23-26 August 2016
OUYANG Ming	22nd International Conference on Computational Statistics, Oviedo from 23-26 August 2016

## Fan Fang Qi Ying Memorial Scholarship, Fan Fang Qi Ying Memorial Bursary & Undergraduate Student Overseas Exchange Sponsorship Scheme

Department of Statistics has set up a new scholarship and two sponsorship schemes:

Fan Fang Qi Ying Memorial Scholarship (范方啟英紀念獎學金), Fan Fang Qi Ying Memorial Bursary (范方啟英紀念助學金) and Undergraduate Student Overseas Exchange Sponsorship Scheme.

Fan Fang Qi Ying Memorial Scholarship and Fan Fang Qi Ying Memorial Bursary were established with donations made by **Professor Gu Ming Gao** (顧鳴高教授), a total of HK\$1 million, to The Chinese

University of Hong Kong for offering a number of awards to the undergraduate students of the Department of Statistics with effect from the academic year 2016/17.

As for Undergraduate Student Overseas Exchange Sponsorship Scheme, it aims to encourage and enable more undergraduate students to participate in overseas exchange program with a view to increasing their international exposure and allowing them to gain global insight.

For details, please visit our department website.



### — 30 Years Reunion Dinner —

Year 2016 marked the 30th anniversary of the Department of Statistics. The Alumni Association organized "30 Years Reunion Dinner" at Happy Valley Stand, Happy Valley Racecourse on 3 June 2016, celebrating the 30th Anniversary of the department and welcoming a new cohort of graduates. Faculty members, staff and over 200 alumni graduated in different years gathered in the reunion dinner.



▲ Professor Joseph Sung, Vice-Chancellor and President, and Professor Qiman Shao, Chairman of the Department of Statistics were invited to give welcoming addresses for the dinner.



In celebration of the 30th anniversary of the Department of Statistics, the Alumni Association launched a fundraising campaign to establish a new scholarship scheme entitled "CUHK Statistics Alumni and Mentors Scholarship" which is awarded to students with outstanding academic performance. A total of \$207,080 was donated by our alumni and the Vice-Chancellor announced in his speech that he would like to make a donation of HK\$2,920 in support of this campaign, so as to round up the total donation amount from HK\$207,080 to HK\$210,000. We would like to express our sincere gratitude to the Vice-Chancellor and alumni for their donation and support.

A check presentation ceremony took place during the dinner. Thank you for all of the generous donations in support of our department!

# The Institute of Mathematical Statistics Asia Pacific Rim Meeting (IMS-APRM)

The 4th meeting of the Institute of Mathematical Statistics Asia Pacific Rim Meeting (IMS-APRM) was held from 27 June 2016 to 30 June 2016 in the Yasumoto International Academic Park. More than 600 scholars and researchers from various countries participated in the conference including two plenary speakers – Prof. Persi Diaconis and Prof. Iain Johnstone from Stanford University and seventeen distinguished lecturers.



## Distinguished Lecturers:

DL01

Recent Advances in Machine Learning  
for Personalized Medicine

**Michael Kosorok,**  
The University of North Carolina at Chapel Hill



DL05

Particle Representations for Measure-Valued  
Processes and Stochastic Partial Differential  
Equations

**Thomas G. Kurtz,**  
University of Wisconsin-Madison



DL02

Building Bridges: New Bayesian Insights  
into Old Problems

**Kerrie Mengersen,**  
Queensland University of Technology



DL06

Model Selection in High-Dimensional Regression  
and Graphical Models and Its Applications

**Tze Leung Lai,**  
Stanford University



DL03

Fusion Learning - Fusing Inferences from  
Diverse Sources

**Regina Y. Liu,**  
Rutgers University



DL07

Analysis of Non-Euclidean Data: Use of  
Differential Geometry in Statistics

**Rabi Bhattacharya,**  
The University of Arizona



DL04

From Cells to Populations: Modeling  
and Inference for Genomic Data

**Elizabeth Thompson,**  
University of Washington



DL08

Heterogeneity in Large-Scale Data, with  
Connections to Causal Inference

**Peter Lukas Buhlmann,**  
ETH Zurich, Seminar for Statistics



## Welcoming Reception

There was a welcome reception arranged on 26 June 2016. Participants enjoyed refreshments and drinks after registration.

## Opening Ceremony

The IMS-APRM was held at CUHK for the first time. Its opening ceremony was officiated by Professor Benjamin Wah, Provost of CUHK; Professor Richard Davis, President of the Institute of Mathematical Statistics; Professor Ming-Yen Cheng, Chair of the Scientific Program Committee; and Professor Qi-Man Shao, Chair of the Local Organizing Committee.



Plenary Speaker

**Persi Diaconis's** lecture on "Understanding Importance Sampling"



Plenary Speaker

**Iain Johnstone's** lecture on "Low Rank Structure in Highly Multivariate Models"



▲ (From left to right) Prof. Poon Wai Yin, Prof. Ming-Yen Cheng, Prof. Persi Diaconis, Prof. Benjamin Wah, Prof. Iain Johnstone, Prof. Richard Davis and Prof. Shao Qiman

DL09

Recent Advances in Covariance Estimation

**Ja-Yong Koo,**  
Korea University



DL10

Statistical Analysis for Social Network Data

**Hansheng Wang,**  
Peking University



DL11

Design of Experiments

**Ching-Shui Cheng,**  
Academia Sinica



DL12

Nonstationary Time Series: Past, Present and Beyond

**Ngai Hang Chan,**  
The Chinese University of Hong Kong



DL13

Recent Development of Statistical Inference Under Dimension Reduction Structure

**Lixing Zhu,**  
Hong Kong Baptist University



DL14

Statistical Inference for Stochastic Processes: Asymptotic Theory and Implementation

**Nakahiro Yoshida,**  
The University of Tokyo



DL15

Random Networks

**Rahul Roy,**  
Indian Statistical Institute



DL16

Variational Inference

**Matt Wand,**  
University of Technology Sydney



DL17

Sparse Learning from Covariance

**Jianqing Fan,**  
Princeton University



## Snap Shots of Other Sessions, Coffee Break and Excursions

The conference consisted of five sessions. Besides a series of distinguished lectures, there were invited paper sessions, topic-contribution paper sessions, contributed paper sessions and poster sessions, covering a wide range of topics in statistics and probability and presenting recent developments and the state of the art in a variety of research topics.



Coffee Break on 27 Jun



Participants enjoyed well-known harbor view in Hong Kong through joining the excursion.



## Gala Dinner

The conference banquet took place in ClubONE of Science Park on 28 June 2016. During the banquet, scholars and researchers had opportunities to mingle with each other, facilitating academic exchange.

Acrobat & kung fu show and face changing performance prepared by The Hong Kong Tourism Board provided a chance for guests to enjoy traditional performances in Chinese culture. The banquet was full of festivity and merriment.



Face Changing Performance

**IMS-APRM** aims to provide an excellent forum for scientific communications and collaborations for the researchers in Asia and Pacific Rim, and promoted communications and collaborations between the researchers in this area and those from other parts of the world. For more information about the conference, you may visit <http://ims-aprm2016.sta.cuhk.edu.hk/>

## Seminars and Distinguished Lectures in 2016

The Department organized a number of seminars and distinguished lectures in 2016. We are happy to highlight the distinguished lectures below. Please also visit our website for past events that the department conducted.

	Speaker	Topic	Date
	Prof. Louis H. Y. CHEN	From Palm theory to Stein's method for random measures	1 March 2016
	Dr. Ivan S.F. CHAN	Statistical Leadership and Innovations in Pharmaceutical Development	5 July 2016
	Prof. Michel LEDOUX	Stein's method, logarithmic Sobolev and transport inequalities	11 October 2016
	Professor Howell TONG	On model selection from a finite family of possibly misspecified time series models	4 November 2016
	Professor Amir DEMBO	Walking within growing domains: recurrence versus transience	25 November 2016

### M.Sc. in Risk Management Science Programme Annual Dinner 2016

M.Sc. in Risk Management Science Programme Annual Dinner was organized on 7 May 2016 in Royal Plaza Hotel. A total of 80 faculty members, lecturers, staff and students took part in the annual dinner. In the Award Presentation Ceremony, certificates were presented to 6 awardees in recognition of their outstanding performance.



### M.Sc. in Data Science and Business Statistics Annual Dinner 2016

M.Sc. in Data Science and Business Statistics Annual Dinner was held on 30 April 2016 at The Salisbury, YMCA of Hong Kong. A total of 58 faculty members, staff and students attended the annual dinner. Faculty members presented certificates to 11 students with excellent academic performance in the Award Presentation Ceremony.



# Sharing from . . . . . ✈️ Awardees of Overseas research Award

**Lai Ying Ying** (*Ph.D. in Statistics*) . . . . .

Imperial College London

With the support of the Overseas Research Award for Ph.D. in Statistics students offered by the department, I visited Professor Harry Zheng in the Department of Mathematics, Imperial College London from March to May 2016.

With the sincere and helpful guidance of Prof. Zheng, I completed a new manuscript on "Two-party Governance: Cooperation versus Competition," in which we compared the Nash game and Pareto game for two leaders and a large group of followers. In addition to presenting theoretical results, we conducted numerical studies to illustrate the effect of different games on followers' value function. Our result shows that it is impossible to say whether cooperation or competition is better for a whole community; different strategies should be adopted under different conditions. Even under the same condition, a "better strategy" may become a worse one as time passes.

Apart from my research project, I also attended a graduate course titled "Functional Ito calculus and path-dependent Kolmogorov equations," which introduced pathwise Ito calculus, the functional change of



variable formula and the new Martingale representation formula. I also completed the first draft of my thesis during my visit.

I shared ideas with students from different countries who were working in the same office. It was also a pleasure to discuss my work with Prof. Zheng's Ph.D. students and visiting scholars.

I enjoyed my visits to London's countless historic and modern tourist spots, including the British Museum, Natural History Museum, Big Ben and Greenwich Observatory. I also visited Cambridge, where I tried punting in the river Cam, and I had a nice tour in Scotland during the Easter holiday. The spectacular scenery of Scotland is fantastic and unforgettable.

I would like to express my deep gratitude to my supervisor Prof. Yam and my host supervisor Prof. Zheng, and to our department for providing me with such a great opportunity. Furthermore, I thank my friends in London and the department staff for assisting me throughout my visit.

Luo Xiangyu (Ph.D. in Statistics)

Yale University



My overseas research trip at Yale University has come to an end, with fulfillment from both academic and social perspectives as well as an appreciation that overwhelms me at this moment.

First, my sincere thanks go to the CUHK Department of Statistics and RGC for giving me the opportunity to conduct overseas research at Yale University. I would also like to acknowledge Prof. Wei, Yingying, my supervisor, for being so supportive and caring during my stay in the United States, and Prof. Ma, Shuangge, my supervisor at Yale, for his professional expertise and valuable suggestions, which have greatly refined my understanding of sparse canonical correlation analysis (CCA) and relevant optimization techniques. My appreciation also extends to my friends, new and old, with whom I shared many joyous moments after work.

I briefly outline the motivation of my research project at Yale, how it is formulated as an optimization problem and how to solve it as follows. Human cells display diverse phenotypes (e.g., neural cells vs. liver cells) because of the different expression levels of genes in distinct cell types. Several factors have been revealed to influence gene expression. One of them is DNA methylation. In humans, DNA methylation often occurs at CpG dinucleotides. Highly methylated CpG sites in promoter regions can suppress the expression of downstream genes. I asked two research questions. First, which genes are influenced by the methylation of which CpG sites? Finding the CpG-gene modules can help disclose gene regulation mechanisms from an epigenetic perspective. Second, when multiple datasets (from multiple diseases) are available, what kind of similarity can we propose to borrow information across datasets?

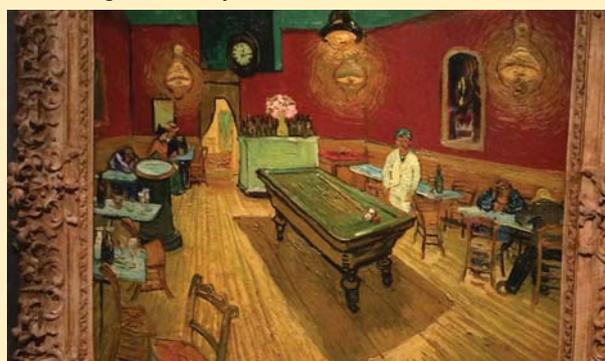
To answer question one, I used sparse CCA to connect gene expression data and DNA methylation data by simultaneously maximizing the Pearson correlation of linear combinations of the two types of data and considering the sparsity for an interpretable result. To deal with the second question, I proposed introducing rank similarity to the two datasets. In other words, when a CpG site regulates gene expression in one disease more strongly than any other CpG site, it is very likely that that CpG site in a second disease also regulates gene expression the strongest. We

took advantage of a coordinate descent algorithm and isotonic regression to obtain a solution that had a better performance than carrying out sparse CCA separately in each dataset in the simulation study.

During the training, I attended a Joint Statistical Meeting and gave a twenty-minute presentation at a session hosted by the ASA biometrics section. I was awarded a Student Paper Travel Award Certificate.

In addition to conducting research at Yale, I learned a lot by receiving training there. Yale provided me with many excellent education facilities, access to postgraduate lectures and seminars given by well-known professors and opportunities to attend interesting outdoor social activities. I often read papers and wrote code in the Center for Science and Social Science Information (CSSSI), a great place to study, think and discuss with friends. Moreover, I audited two statistics courses, through which I was inspired to find new research questions, and learned how to impart knowledge to students in an effective way as a teaching assistant or an instructor.

I was impressed by the artistic atmosphere of the campus. On a visit to Yale University Art Gallery, an oil painting captured my attention: "The Night Café" by Vincent van Gogh. In that vivid picture, you can imagine as many interesting stories as you like.



All in all, this experience has broadened my academic circle, enhanced my knowledge and improved my ability to deal with real statistical problems.





## The Statistics Department

The Statistics Department was in Sequoia Hall, just next to the main quad. It was a two-floor building and my office was on the second floor. (There is no “ground floor” in America.) I found the offices of many famous statisticians, including Professor Persi Diaconis, Professor Tze Leung Lai, Professor Amir Dembo, Professor Bradley Efron and Professor Saurav Chatterjee. I was in an office for visitors, just like Rm125 LSB in our department. Because it was summer, there were not so many visitors in the office. Two weeks after I arrived there, a visiting scholar, Professor I-Ping Tu from Taiwan, came to the office. This was the professor who gave a talk in our department last year. The world is so small!

## My Study at Stanford

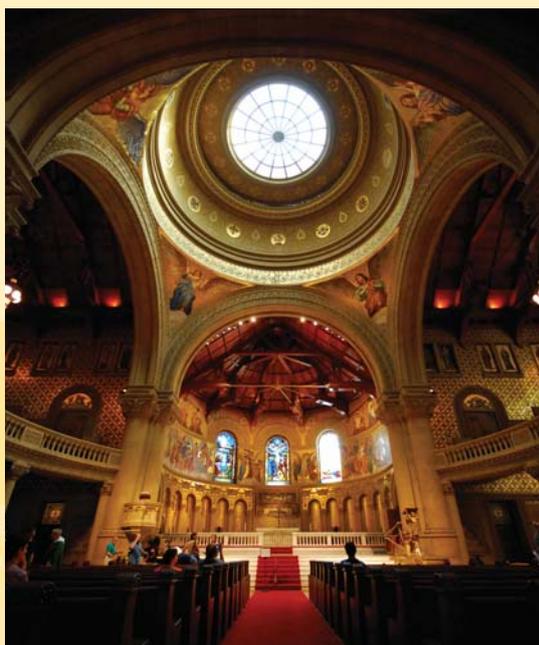
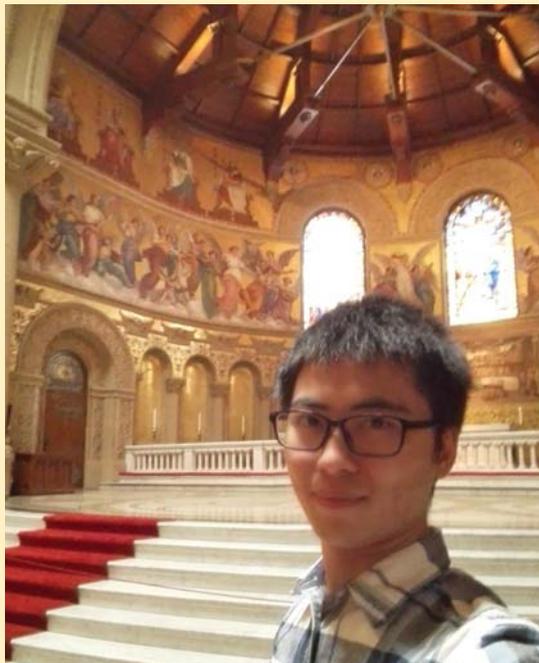
I am interested in probability theory and Stein’s method, and I was supposed to visit Professor Saurav Chatterjee, a very famous scholar in this field. However, he was in India in July. He suggested I visit Professor Diaconis. Professor Diaconis was a very kind old man who usually made humorous and interesting conversation. When I first visited his office, he gave me some problems related to my research interest and encouraged me to learn more. One afternoon, he even came to my office to invite me to have a coffee with him. During this coffee break, he reviewed my recent work and introduced a new topic to me. The lemon tea I drank that afternoon was the sweetest one of my life.

I first met Professor Chatterjee on August 1. He was a genius Indian mathematician and statistician. He had written many top papers on probability theory, and I had used his method to get some new ideas. Some of his words made a big impression on me: “Keep doing your best, and good things will come.”

There were also some summer courses at Stanford. I took one titled “Models with hidden structure.” The instructor, Stephane Robin, was a visiting professor from France. I also attended the summer seminars in the statistics department. One of the speakers was the famous Professor Efron, who first introduced the bootstrap method in the 1970s.

## The End of My Visit

As my return date drew closer, I felt that two months was really a short time. I met many people, learnt a lot and experienced a lot in this beautiful university. I will cherish this experience forever.

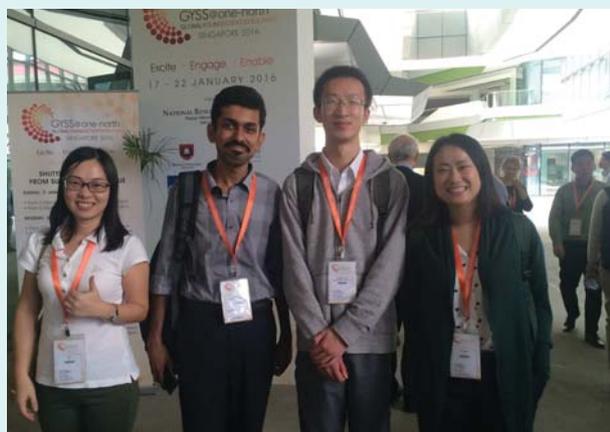


# 2016 Global Young Scientists Submit (GYSS)

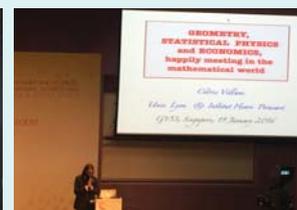
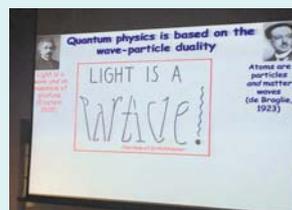


**Luo Xiangyu** (*Ph.D. in Statistics*)

I am honored to have been nominated by the Department of Statistics to attend the 2016 Global Young Scientist Summit (GYSS). This year, the GYSS conference was hosted by Singapore University of Technology and Design, which was established a few years ago and sponsored by the Singapore government. The conference invites a number of science and technology leaders in a variety of fields, including chemistry, physics and computer science, to give talks. The dream team of speakers includes Nobel Laureates, Fields Medalists and Turing Awardees. The chance to interact with these famous researchers draws the attention of young scientists across the world. I was fortunate to obtain the chance to attend.



us where “entropy” came from. Claude Shannon, who developed information theory, once asked John von Neumann, a great mathematician, how to name the “uncertainty” in his theory. Shannon wanted to use “information,” but that term was overly used. Neumann suggested calling it “entropy” because everyone was familiar with “information” but few people knew “entropy,” and that would mean a good position in a debate!



## New Friends

I made many friends at the GYSS. At the opening ceremony, I met some participants from Hong Kong's universities. Their diverse majors included computer science, chemistry and mathematics. I was unfamiliar with these disciplines, but I tried to discuss them and understand some of the fundamental concepts in these fields. In addition, I made friends with a student from the National University of Singapore. He was from India and had acute insight. I liked him because he enjoyed talking to me, regardless of my poor pronunciation :-). When I said goodbye to him, he wished me good luck with my research. I am truly grateful for all the friends I made at this conference.

## Program Schedule

The program lasted for five days. There were four to five talks each morning and afternoon. In each talk, the speaker introduced his or her achievement that had advanced the development of science and technology or explored an innovative research area. Most of the talks were too state-of-the-art to be understood by outsiders. Compared with the talks that were only understood by a small number of people, some talks were designed to be very straightforward and easy to understand. In this kind of talk, the speaker gave us an overview of his or her research and used interesting pictures to engage the audience. I think I need to learn this ability in my own research to make it clear to other people what I have done and contributed.

## Good Speaker

Prof. Cedric Villani, a French mathematician awarded the Fields Medal in 2010, was one of the good speakers. Although in most people's minds a traditional mathematician is not likely to be good at talking, Prof. Villani captured the audience's attention with his humor and brilliant speaking skills. One day I happened to sit at his table and had lunch with him and other friends. During the lunch, he shared his stories with us. He told

Through this five-day experience, I improved my communication skills with senior and junior researchers, learned how to express what I was working on, understood many hot and important topics and broadened my research views. The conference enhanced my learning and research skills, inspired me to develop new methods to solve tough practical problems and motivated my interests in interdisciplinary study.



# Internship Sharing

**Chan Chi Ching** (*B.Sc. in Statistics*)

Census and Statistics Department

Joining the Professional Attachment Programme for Students of Tertiary Institutions 2016, an internship programme of the Census and Statistics Department (C&SD), was a valuable opportunity for me. The two-month internship experience will certainly be useful in my future career path after graduation.

I worked in the National Income Section 2 under the National Income Branch (1). This section is mainly responsible for the Gross Domestic Product (GDP) by Expenditure component. During my internship, I accomplished two main tasks. First, I developed the summary tables for the commencement of new buildings and for completion of the Building Department. Second, I worked on a model to predict the trend of the gross values of private sector construction sites. In the project I examined the reports from the Building Department and Transport and Housing Bureau. Throughout the research process I applied the knowledge I learned from class. I also learned new concepts, such as heteroscedasticity, serial correlation and the ARIMA process, which I did not previously know of, are closely related to my major area of study. I was also able to consolidate my programming skills in R and Microsoft Excel when I worked on the research.

I acquired many soft skills in addition to hard skills during the internship period. My interpersonal skills were enhanced, and my supervisor and colleagues were willing to help me when I faced difficulties, and always willing to talk with me. My supervisor gave me advice on how to conduct a report that laypeople can understand, and I learned many ways of improving my presentation skills during our discussions.

This two-month internship opportunity was extremely memorable for me, and I enjoyed working in C&SD. I am thankful to the Department of Statistics and C&SD for giving me this valuable opportunity.



**Chen Mengru** (*B.Sc. in Statistics*)

Census and Statistics Department

I am grateful to have been part of the Professional Attachment Programme organised by the Census and Statistics Department this summer. The two-month internship was a meaningful and productive experience for me.

I was assigned to the Demographic Statistics Section (2) in the Demographic Statistics Branch. My main duty was to investigate the various statistical methods of disclosure control of census data adopted by international statistical institutions.

At the early stage of the internship, I felt the task was a little difficult for me as I did not have any preliminary knowledge of the processes and concepts of census. Hence, when I worked on the publications, I had to spend time understanding the meanings of technical terms, and then get the sense of the publications as a whole. Fortunately, under the guidance of my supervisor Mr Lam, I gradually improved.

I produced a 20-page report regarding the methodologies of census disclosure control of several countries. The disclosure control involves the protection of confidentiality and improvement of data quality in census. The report may be used as a reference for further work in the 2016 Census,



to revise the statistical approach of Hong Kong, which brought me a great sense of achievement.

I felt really fortunate to have the opportunity to participate in this programme, as I was able to combine statistical theory with practical use, particularly in the census process, which was a new field to me. I would like to express my gratitude to my supervisor and all the nice, patient and helpful people I worked with. I am certain that all the practical working skills I gained in this internship will benefit me and equip me in my future career.

## Internship Sharing

### Chung Ka Pui (B.Sc. in Statistics)

Census and Statistics Department

I am grateful to have had the opportunity to work in the Technical Secretariat section of the Census and Statistics Department during my summer internship programme. I was mainly responsible for conducting desktop research related to the use of big data for producing official statistics and for a seasonal adjustment programme in other NSOs, and writing R programmes to scrape data from the web for the production of official statistics related to job vacancies.

This internship programme enriched my knowledge of different statistical topics. Through conducting the desktop research, I gained valuable knowledge about recent developments in big data for official statistics. I learned about the possible sources of big data, how it can produce official statistics and how other NSOs deal with its limitations. My understanding of seasonal adjustment was also developed. I learned that a seasonal component should be removed from a time series so that the indexes generated can be meaningfully compared across different months. I also gained detailed knowledge about statistical concepts in seasonal adjustments, such as the X-11 method, the regARIMA model and the SEATS method.

My practical skills were also strengthened in this summer internship programme. In writing R programmes to scrape

data from the web for collecting information about job vacancies, I learned to use the packages in R, such as XML, RCurl and RSelenium for web scraping. I also improved my interpersonal and communication skills through working with my supervisor and colleagues.

This summer internship programme broadened my horizons and enhanced both my academic knowledge and practical ability, such as programming and research skills. The experience I gained will undoubtedly be very useful and valuable for my further studies and my career. I am grateful to have benefited so much from this programme.



### Lam Ka Yu (B.Sc. in Statistics)

ParaDM Co. Ltd

I was very pleased to be selected by the ParaDM Co. Ltd as their Big Data Analyst last summer, through the Summer Internship Programme 2016 organised by the Statistics Department of CUHK. ParaDM is an IT company providing web-based enterprise document management solutions (DMS) for businesses to use in document filing and sharing.

My main duty was to create a priority score formula that would enable users to promptly respond to important and urgent shared documents. The formula is produced by a multiple linear regression model that integrates independent variables, including sharing time, access time and due date. To check if the actual access order matches with the suggested order, a hypothesis test with  $H_0$ : Kendall's Tau Coefficient  $\tau = 0.6$  is regularly carried out. When the formula fails the test, it is enhanced by reviewing the actual access sequences and performing model selection. The suggested model is still in its preliminary stage due to limited time and data available. As definitions of 'important' and 'urgent' documents can vary, there cannot be a 'perfect' priority formula for every user.

I gained three achievements through this internship. First, applying statistical analysis and model design to the DMS was extremely fulfilling. Second, through research and self-learning, I discovered a great deal about computer

science and business management. Third, through short weekly review sessions with the executive and supervisors, I received extensive training in expressing my thoughts and responding to opinions from professionals.

I would like to express my gratitude to Prof Wei Ying Ying for her limitless guidance, support and advice through the whole internship.

Statistics are meaningful and impressive when applied to daily life. Big data is a hot topic and is available everywhere and the key issue is how it can be used to improve people's lives.



**Liu Sik Chung** (B.Sc. in Statistics)

Census and Statistics Department

I applied for this year's summer internship offered by the Census and Statistics Department and was honoured to be selected as one of the interns. I was assigned to the Balance of Payments Branch (2), and was supervised by a statistician. My duties turned out to be very different from what I had imagined. As the 2016 population by-census is soon to be conducted, I was tasked with managing and analysing data, but the Balance of Payment Branch is a division that often works on more complex projects. Generally speaking,



it summarises the economic transactions with the rest of the world over specified periods, identifying the currency that flows in and out of Hong Kong.

As an intern, I conducted desktop research on direct investors and subsidiaries of companies based on information from administrative sources, such as chambers of commerce in Hong Kong and overseas stock exchanges. Chambers of commerce can include thousands of companies, so my task was to find out which were related to Hong Kong. I also compiled methodologies of direct investment statistics using R-programming. This was the first time I had applied what I learnt to practice, although it was very challenging. In class, many assumptions made the calculation simpler, but in practise, real factors cannot be ignored. However, with the help of my manager, I managed to complete the work.

It is an honour to work at the Census and Statistics Department and I gained many fruitful experiences during the internship.

**Ng Lok Yeung** (B.Sc. in Statistics)

Census and Statistics Department

This summer I participated in the internship programme, working at the Balance of Payments Branch (2) of the Census and Statistics Department. I would summarise my internship experience as a valuable opportunity to experience a real working environment, where I learnt practical skills in various work situations.

My first assignment was to perform desk research on direct investors of companies listed on the Hong Kong Stock Exchange, up to or until the end of 2015. I was required to search for listed companies' annual reports and Disclosure of Interest forms, and to identify their actual direct investors (holding more than 10% of shares), to facilitate the checking of survey results by my branch. From this, I learnt how to screen a large number of documents and to identify and record the relevant information.

My second task was to perform desk research on conversion results in changes in aggregate balance, money supply and inter-bank interest rates resulting from

the Hong Kong Monetary Authority's operation of convertibility undertakings under the Linked Exchange Rate System, along with the interest rate differential between Hong Kong and the United States. My supervisor was preparing to give a talk to the Department staff on this topic. Compared to the former task, this was certainly more challenging as initially I had insufficient knowledge about the topic. I needed to search for much of the basic information from approved sources, to improve my understanding. I was then required to identify the underlying relationships between the keywords, and produce diagrams to explain them. I tried my best to obtain as much information as possible, though it was a very tough mission.

This internship provided me with extensive knowledge about the generation of government statistics. Even though I may not pursue a career in the government, I still gained much from this experience.

## Internship Sharing

**Ding Jialu** (B.Sc. in Risk Management Science)

Milliman

To fulfill the requirement of the course RMSC4202 practicum, I spent six months in a branch office of a worldwide actuarial consulting company called Milliman in Hong Kong. My main project was to support actuaries to complete various actuarial consulting projects to help the organization fulfill its mission.

During the internship, I mainly participated in market research projects and market premium statistics collection and manipulation. First, I gained exposure to a



variety of activities across several markets in the Asia Pacific region, mainly focusing on profit testing and embedded value calculation, insurance model point checking to validate data (lapse rate, commission rate, surrender value and dividend rate checking) and collecting data from the Prophet model and checking for consistency with the policy details provided by the client. Second, I gathered information using various formal and informal qualitative methods, including using Hong Kong company financial reports and analysis reports to conduct insurance product research, examining mergers and acquisitions information for the insurance industry in the past 20 years and reading the product brochures of several companies to prepare a product development report.

I gained a lot of real life experience through the internship and now have a broader knowledge of risk management and actuarial science. Risk is not only the chance that an undesirable event will occur, but also an opportunity to manage this chance and tweak it into a valuable asset. Through the excellent opportunity of the internship and under the patient guidance of my supervisors, I not only became familiar with various actuarial and insurance risk management applications, but also understood concepts of risk management in the real market to prepare me for a better career path.

**Ng Ka Kit** (B.Sc. in Risk Management Science)

Ernst & Young Advisory Services

Last spring, I had the chance to work as an intern in the Financial Services Risk Management Department of Ernst & Young Advisory Services for six months.

During this time, I assisted the valuation team and helped to review the fair value of over-the-counter financial products such as swaps, options, bonds and futures for financial reporting purposes.

To perform a valuation review for different derivatives, the appropriateness and reasonableness of the parameters used, such as risk-free rates and volatilities, the model used and the assumptions made in the valuation are examined. A valuation is performed to discover if there are any discrepancies in the fair value calculated.

Through my opportunity to assist with the valuation team, I gained practical experience in building derivatives

pricing models for a wide variety of financial products and in financial data extraction using different software. Moreover, I now understand more about the practice of choosing appropriate parameters and models in derivatives valuation.

In addition to gaining experience and knowledge in the area of derivative pricing during the internship, I had the chance to develop my soft skills. When issues with the parameters and models adopted were discovered, I would communicate with colleagues to understand the rationale behind the issues and express my opinion from another perspective.

Working as an intern on the valuation team was a fulfilling experience and a valuable opportunity for me to apply and deepen my understanding of what I had learned about derivative pricing in my university studies.