

AMAgazine

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AMA newsletter

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Chair Professor Defeng Sun is appointed as Head of Department of Applied Mathematics

The Hong Kong Polytechnic University
Twenty-fifth Congregation (Faculty of Applied Sciences)
香港理工大學第二十五屆畢業典禮
應用科學及紡織學院



HIGHLIGHTS

On 1 July 2019, Professor Defeng Sun assumed the duty of the Head of the Department. He joined PolyU as a Chair Professor of Applied Optimization and Operations Research in our Department on 1 August 2017.

Having been appointed as the 10th Head of the Department, Prof. Sun said 'I am honoured and excited to serve as the Head of this dynamic department. With the mission of facilitating Mathematics learning in mind, I will carry the torch and light the way for all AMA colleagues to provide quality teaching and conduct excellent research in Applied Mathematics, with a special focus on the area of Data Science and Analytics.'

ACCOMPLISHMENTS

AMA received RGC funding to support 28 projects in 2019/2020 - 2020/2021

The Department's research has been well acknowledged by receiving funding support for 16 and 12 projects from RGC General Research Fund and Early Career Scheme in 2019/2020 and 2020/2021, respectively.

Chair Professor Defeng Sun is named SIAM Fellow 2020



Congratulations to Professor Sun who was elected as 2020 Fellow of the Society of Industrial and Applied Mathematics (SIAM) in recognition of his contributions to algorithms and software for conic optimization, particularly matrix optimization.

SIAM Fellow is an honorific title for life, and all Fellows will be listed on the SIAM website. Having been awarded with the prestigious triennial Beale–Orchard-Hays Prize in 2018 for Excellence in Computational Mathematical Programming by the Mathematical Optimization Society, Prof. Sun's distinguished research work and contributions are once again acknowledged through the SIAM Fellowship.

The full list of 2020 SIAM Fellow Class :

<https://sinews.siam.org/Details-Page/siam-announces-class-of-2020-fellows>

Dr. Fridolin Ting and AMA PALMS project team scored 8 international educational awards in 2019/2020

Dr. Fridolin Ting, our Teaching Fellow, and his team of UGC Teaching and Learning Pedagogic and Active Learning Mobile Solutions (PALMS) Projects are well recognized for their contributions to innovations in STEM tertiary education in 2019/2020. The team garners 8 awards as follows:

- The Wharton-Quacquarelli Symonds (QS) Reimagine Education Awards & Conference, England (3 awards)
- The EduTech Asia Awards, Singapore (3 awards)
- The 5th e-Learning Excellence Awards at the 18th European Conference on eLearning 2019, Denmark (1 award)
- The EdTech Awards 2020 (1 award)

For details, please visit

<http://palms.polyu.edu.hk/international-awards/>



Dr. Fridolin Ting (right) at the 18th European Conference on eLearning 2019, Denmark

After obtaining a Doctor of Philosophy degree in Operations Research and Control Theory from the Chinese Academy of Sciences, Prof. Sun worked as a postdoctoral fellow in the University of New South Wales (UNSW) in Australia. After his postdoctoral training at UNSW, Prof. Sun joined the Department of Mathematics of the National University of Singapore (NUS) as an Assistant Professor in 2000, and was promoted to Associate Professor in 2006 and then to Professor in 2009. During his tenure with the NUS, Prof. Sun also served as the Deputy Director (Research) of the NUS Risk Management Institute (RMI) from 2009 to 2014 and the Acting Program Director for RMI's Master of Financial Engineering program in 2014.

Prof. Sun's main research field is optimization. He has published over 100 papers mostly in top optimization journals and has written a number of software packages for solving large-scale complicated optimization problems, including SDPNAL/SDPNAL+ for general purpose large-scale semidefinite programming, the codes for correlation matrix calibrations that are widely used in the financial industry, and most recently, the packages including SuiteLasso for various statistical regression models. Prof. Sun also actively involves in many professional activities, including associate editorship for journals such as Mathematical Programming and SIAM Journal on Optimization. Currently he focuses on establishing the foundation for the next generation methodologies for big data optimization and applications.



In recognition of his remarkable contributions, Prof. Sun has been honoured with a number of prestigious awards, including:

- SIAM Fellow in 2020 (SIAM: Society for Industrial and Applied Mathematics);
- Plenary speaker at "SIAM Conference on Computational Science and Engineering (CSE21)", to be held at Fort Worth, Texas, USA, in 2021;
- The triennial Beale–Orchard-Hays Prize for Excellence in Computational Mathematical Programming by the Mathematical Optimization Society, 2018;
- Plenary speaker at "SIAM Conference on Optimization (OP11)", Darmstadt Conference Center, Darmstadt, Germany, 2011;
- The inaugural Outstanding Scientist Award, by Faculty of Science, National University of Singapore, 2007.



acpi



QS REIMAGINE EDUCATION

Wharton THE ALFRED WHARTON LEARNING LAB

ACCOMPLISHMENTS

AMA's first QEF Project

In addition to international recognition, Dr. Fridolin Ting also received AMA's first Quality Education Fund (QEF) in 2019/20 for his new project titled 'Developing Active Learning Pedagogies and Mobile Applications in Secondary School Mathematics Education'.



Dr. Hua Zhang, FAST Faculty Awards 2018/19 (Teaching)



Dr. Hua Zhang (left) and students

AMA Alumni awarded the Medal of Honour

Miss Ka Yi Lee, our Investment Science graduate of 2016, was awarded the Medal of Honour (MH) 2019 by the HKSAR Government in recognition of her outstanding achievements in international squash competitions. The 2019 Honours List is published in the Government Gazette on 1 July 2019.



EVENTS & ACTIVITIES

Distinguished Lectures and Forums



Optimal Energy-conserving Discontinuous Galerkin Methods for Wave Equations by Prof. Chi-Wang Shu, Brown University, USA,
26 April 2019

Mathematics and Computation for Inverse Scattering Problems by Prof. Gang Bao, Zhejiang University, China,
21 May 2019



Topological Event History Analysis by Prof. Robin Henderson, Newcastle University, UK,
22 May 2019

Consistency of Stationary Solutions of Coupled Nonconvex Nonsmooth Empirical Risk Minimization by Prof. Jong-Shi Pang, University of Southern California, USA,
18 June 2019



Graphon Control and Graphon Mean Field Games by Prof. Peter E. Caines, McGill University, Canada,
28 June 2019

EVENTS & ACTIVITIES

Workshops

The PolyU AMA - RIKEN AIP Joint Workshop on Optimization and Machine Learning
2 - 3 May 2019



Workshop on Recent Progress on the Reaction-diffusion Equations Arising in Biology
16 - 17 May 2019



Symposium on Emerging Innovations and Evaluation of Technology Enhanced Active Learning Pedagogies in Tertiary Education
10 July 2019

Summer Workshop 2019



Congregation Ceremony

On 8 November 2019, we proudly conferred 174 graduates who have successfully completed studies in the academic year of 2018/19.



CAS AMSS-PolyU Joint Laboratory of Applied Mathematics Workshop in PolyU Shenzhen Base
22 - 23 August 2019



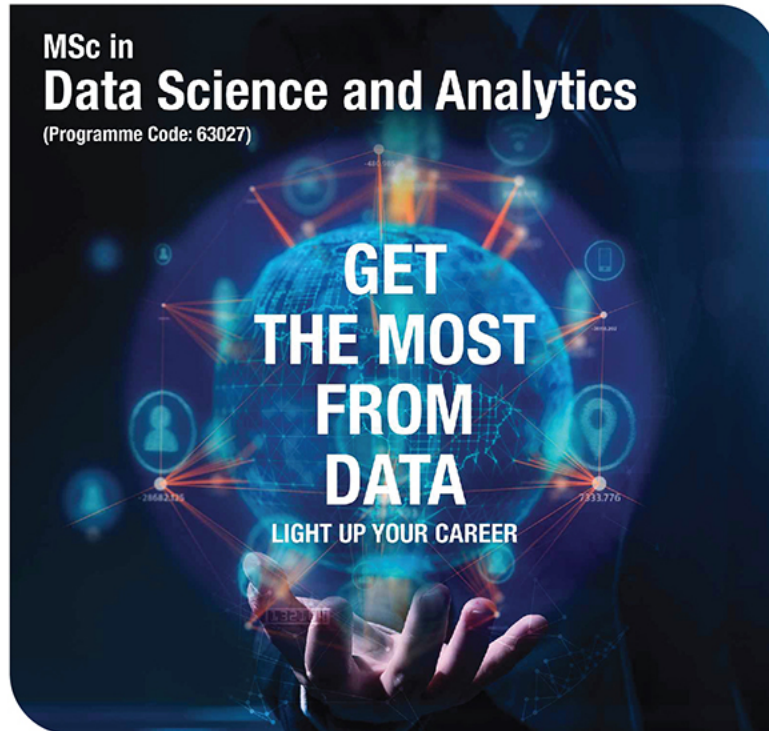
Prof. Ya-xiang Yuan joined this workshop with a group of colleagues and students from AMSS



Research students' posters session organized by SIAM Chapters of PolyU and AMSS

PROGRAMME NEWS

New Taught Postgraduate Programme: MSc in Data Science and Analytics



In this era of big data, large data sets are generated every day in various areas in society and industry, such as internet data, social network data and financial transaction data. It is challenging to analyze this unprecedentedly large volume of data and extract information from it. To create values out of data, one inevitably has to combine techniques from mathematics, statistics and computer science. Candidates who have highly developed mathematical, statistical and computing skills are thus in great demand, both in industry and research globally.

In view of the rising demand of data analysts, the Department launches a new Taught Postgraduate programme, Master of Science in Data Science and Analytics, to nurture graduates with modern data science skills that cut across core disciplines of mathematics, statistics and computer science. Upon completion of this programme, graduates will be able to pursue careers as data analysts in a broad range of industries e.g. finance, IT, telecommunication. This programme will enroll its first batch of students in 2020/2021 academic year.

STUDENT NEWS

AMA welcomed the first batch of students of BSc (Hons) in Investment Science and Finance Analytics (ISFA)!

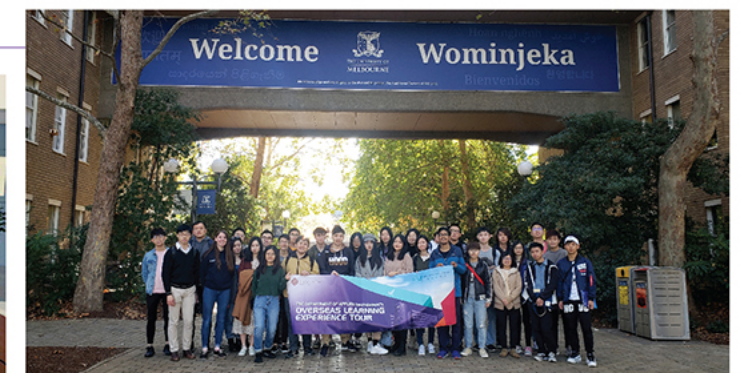
ISFA's first batch of students has started their studies in September 2019. This reengineered programme has incorporated computer science elements such as programming language study to supplement students' training in mathematical and statistical skills, with a special emphasis on applications in investment and finance analytics. Prof. Defeng Sun, Head of the Department, Prof. Cedric Yiu, the Programme Leader, and his team welcomed the students on the Orientation Day held on 26 August 2019. We wish them all the best in their studies.



Learning Experience Tours 2019



Hangzhou



Melbourne

AMA becomes the Bloomberg Experiential Learning Partner

We are pleased to become the Bloomberg Experiential Learning Partner (ELP), which is designed to recognize academic institutions that are leaders in experiential learning through the integration of the Bloomberg Terminal into their curricula.

Under this partnership, AMA students would gain 1 year free web-access (on and off campus) upon registration to the Bloomberg Market Concepts (BMC) course, a self-paced e-learning course that provides an interactive introduction to the financial markets. It enables students to gain hands-on experience with the investment markets through access to real time investment data, analytical tools, and trading simulations. It will help prepare them for practical investment analysis and portfolio management, and give them a recruiting edge in their internship and future career.



Bloomberg
Experiential
Learning Partner



Source : Bloomberg

Dean's Honour List 2018/2019

BSc (Hons) in Investment Science					BSc (Hons) in Data Science and Analytics	
HUANG Qiwen	JIN Huilin	LIU Shuyu	LUO Guangze	LYU Jiangyu	SHEK Ho Yin	
MA Linkai	NG Hoi Min	REN Zhihao	WANG Cuiqun	ZHAO Xiaohan	TSE Uen Lok	

MSc in Applied Mathematics for Science and Technology		MSc in Operational Research and Risk Analysis	
CHEN Xiaodi	SHAM Chung Nam	LI Xiuyan	LIU Rongshan
PEI Yu	WANG Di	WANG Weicheng	ZHU Kehua

Graduates awarded with First Class Honours/ Distinction 2018/19

BSc (Hons) in Investment Science		MSc in Applied Mathematics for Science and Technology		MSc in Operational Research and Risk Analysis	
HUANG Jiayang	LI Yanke	CHEN Xiaodi	TANG Leo Wai Hung	CAI Jueqi	NIE Jiayi
LUK Kin Fung	SHEN Aowei	GUO Jiaxin	WANG Di	GUO Cong	QING Lanming
SU Siqiang	WANG Cuiqun	GUO Wenxi	YE Jiawei	HAO Rujia	WANG Weicheng
		LI Yufeng	YUAN Xuefeng	LI Xiuyan	YU Huan
		PEI Yu		LIU Rongshan	ZHAO Hanyu
		SHAM Chung Nam		MA Lian	ZHU Kehua



Chair Professor
Defeng Sun



The Society of Industrial and Applied Mathematics (SIAM) recognizes distinguished scholars for their exemplary research and outstanding service through its Fellows program. Awarded with this honorific title for life, Prof. Sun shared how he feels of being a SIAM Fellow and his tips for building a successful research career.

A : AMA S : Prof. Defeng Sun

A: How do you feel about being elected as a SIAM Fellow?

S: I feel quite honored and humbled to be selected into the 2020 Class of SIAM Fellows together with other 27 distinguished Applied Mathematicians and Computational Scientists.

A: As a SIAM Fellow, would you expect more research collaboration coming forward, or would this make a difference to your current work?

S: Given that I already have my hands full with too many commitments and collaborative projects with various parties, I do not expect it would make any significant difference to my research activities. Perhaps I may be requested to write more recommendation letters for young researchers, which I am happy to do so.

A: So far, do you have any representative research works? Why are they representative?

S: There are two projects immediately coming to my mind. The first one is my joint work with Prof. Jie Sun titled "Semismooth matrix valued functions" [Mathematics of Operations Research, 27 (2002) 150—169]. This work starts a new field of nonsmooth matrix analysis. It lays a foundation for using Newton-CG augmented Lagrangian method to solve large scale semidefinite programming problems, which eventually brought the Beale—Orchard-Hays Prize to me and my co-workers in 2018 by the Mathematical Optimization Society.

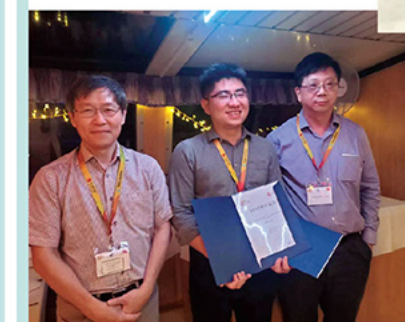
Another one is a co-authored work of Dr. Xudong Li, Prof. Kim Chuan Toh and myself named "A highly efficient semismooth Newton augmented Lagrangian method for solving Lasso problems" [SIAM Journal on Optimization 28 (2018) 433—458]. It demonstrates how one can use the second-order methods with first-order complexities to solve really big machine learning problems even with high accuracy. In fact, this work brought Dr. Li the Best Paper Prize for Young Researchers in Continuous Optimization (one winner in every three years) in 2019 by the Mathematical Optimization Society.



Prof. Sun and his collaborators Prof. Kim-Chuan Toh (2nd from right) and Dr. Liuqin Yang (2nd from left) received the Beale—Orchard-Hays Prize in 2018



Prof. Sun with Prof. Jie Sun (middle) and Prof. Duan Li (left)



Prof. Sun with Dr. Xudong Li (middle) and Prof. Kim-Chuan Toh (left)

A: As Head of the Department and a renowned researcher, how do you strive balance between your Headship, research and teaching?

S: I am still struggling with finding a balance among these roles. Perhaps I should leave more challenging mathematical problems for young researchers instead of working on them solely. This is a painful yet important step for passing on the torch and nurturing the younger generations to grow in all aspects. Hopefully, I can find a good balance in the near future.

A: Any advice or tips you would like to share with young researchers for developing a successful research career?

S: I do not feel that I can really give good advice on this part. But I always believe that any young researcher should work on problems that they find interesting instead of jumping on the bandwagon. Of course, this means that one needs to deal with long term loneliness in his/her early research career. Nevertheless, nothing can be compared to doing things that one really likes.

STAFF INTERVIEW

Dr. Fridolin Ting and his Award-winning Teaching and Learning Team



“The COVID-19 pandemic has affected our daily life in every aspect. In a time of lockdown and social distancing, we witness a tremendous rise in the use of e-learning and an accelerated development of online education. Back in 2017, Dr. Fridolin Ting (on the left), Teaching Fellow of AMA, and his team initiated a project titled “Developing Active Learning Pedagogies and Mobile Applications in University STEM Education”. This award-winning project aims to improve students’ overall learning outcomes through active learning. Recently the team received another grant from the Quality Education Fund (QEF) for a new project to incorporate mobile application into secondary school mathematics education. Let’s talk to them for their view on the recent development of e-learning.”

A : AMA P : PALMS project team

A: Could you briefly introduce your PALMS project?

P According to extensive evidenced based research, active learning strategies significantly improve STEM education students’ achievement, understanding and application of concepts. There is also evidence that mobile applications for education enable teachers to improve their teaching practices and engage and highly motivate students by providing them with new opportunities to participate and construct their own learning, individually or collaboratively. Therefore, the main objectives of our UGC Teaching and Learning project branded “Pedagogic and Active Learning Mobile Solutions (PALMS)” are to explore and develop new pedagogies to increase active learning in STEM tertiary education and to cultivate innovative mobile applications to enhance the efficacy of said active learning pedagogies. Please visit website <http://palms.polyu.edu.hk/> for details about our project.

A: This project has won 8 international awards. What are the success factors?

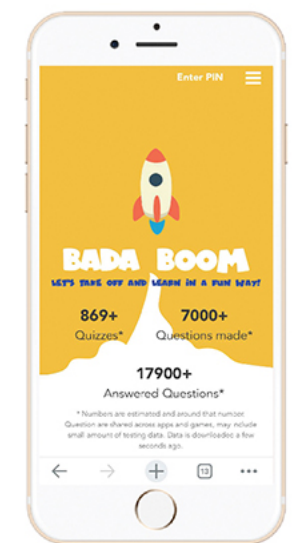
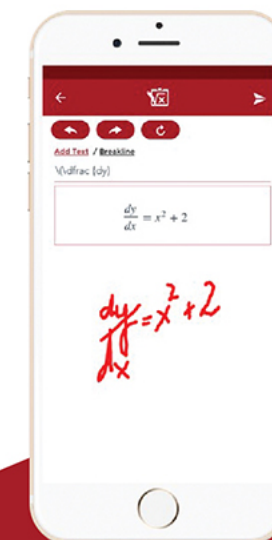
P Our PALMS Project would not have had any type of success without the exceptional effort and contributions from our 30+ wonderful University project collaborators from PolyU and our 3 partner institutions HKU, CUHK and HKBU. In addition, we are grateful for all the support given by the Department of Applied Mathematics, the Faculty of Science and Textiles and the Hong Kong Polytechnic University. Finally, we are fortunate to have a dedicated and talented PALMS Project team.

A: How do the students and teachers respond to the mobile apps developed under this project?

P First, we always want to ask our students and teachers if they want to try something new and fun. Then, overall, when teachers and students are introduced to new active teaching pedagogies and supporting mobile apps/platforms, there is sometimes a hesitation and always a learning curve. We are always careful to tell our students why we want to try out this new method of teaching or use this new mobile application as an effort to make them feel safe and comfortable in their learning environment, and that we have their learning needs, first and foremost, as priority. For teachers, we try to ask them if they’d like to try something new and fun, as opposed to the traditional ways they’ve been teaching, and usually, most are receptive. You may see positive comments from students and teachers in using our active teaching strategies and supporting mobile apps and platforms on our website.

A: What’s your view on the role and development of e-learning in the future? Do you think the COVID-19 pandemic has accelerated its development?

P If we can draw one positive from the COVID-19 pandemic in the field of education, it is that e-learning is definitely helpful in teaching. Some students, while learning online, have asked if we can use a certain technology (or some teaching method they’ve experienced online) back to face-to-face teaching. I tell them definitely, if they think it’s a helpful tool for them to learn. For instance, most students like the fact that they can ask questions anonymously during live online teaching on various platforms like Zoom, MS Teams or BB Collaborate. That is essentially why our PALMS project developed YoTeach! about 2 years ago, and why it has been a very useful tool for teachers and students to have.



STAFF NEWS

New administrative appointments and promotions:

- Chair Prof. Defeng Sun assumed the Headship of the Department on 1 July 2019, while Prof. Cedric Yiu and Prof. Xingqiu Zhao were appointed as Associate Heads on 1 April 2019 and 1 March 2020, respectively
- Profs. Xun Li and Xingqiu Zhao were promoted to Professors in July 2019 and July 2020 respectively
- Drs. Buyang Li and Ting Kei Pong were promoted to Associate Professors in July 2020
- Mr. Peter Lo was promoted to Technical Officer in July 2020

Dr. Daihai He, Dr. Yijun Lou and Dr. Lin Yang (From SN) help the fight against COVID-19 pandemic with mathematics models



Amid the COVID-19 outbreak, Dr. Daihai He and Dr. Yijun Lou from our Department and Dr. Lin Yang from the School of Nursing (SN) teamed up with their students and collaborators from mainland China and worked hard on finding mitigation strategies to fight against this global pandemic. They are among the first in the world to conduct a series of studies and estimate the transmission rate, case fatality rate, and gender disparity of COVID-19. Using statistical models, they also investigated the underreport of COVID-19 cases in Wuhan during early January when the testing capacity for SARS-CoV-2 virus was limited. Their works aim to put the pieces of puzzles together to reveal the true face of the outbreak which is essential for risk assessment and mitigation strategy design. The team have published 11 peer-reviewed papers in medical journals, which have been cited over 600 times according to Google Scholar as of June 2020. Their findings have added important evidence for risk assessment to support the decision-making of mitigation strategies.



Dr. Daihai He (2nd from left) and his students

Dr. Yijun Lou

Dr. Lin Yang

Departmental Best Paper/ Teacher/ Instructor Awards 2019/2020

Congratulations to the following awardees who have dedicated and excelled in their teaching and research:



Dr. Buyang Li

"Unconditional Convergence and Optimal Error Estimates of a Galerkin-mixed FEM for Incompressible Miscible Flow in Porous Media", SIAM Journal on Numerical Analysis, Vol 51, Issue 4, 1959-1977 (2013) (co-author: Prof. Weiwei Sun)

Dr. Ting Kei Pong

"Global Convergence of Splitting Methods for Nonconvex Composite Optimization", SIAM Journal on Optimization, Vol. 25, No. 4, pp. 2434-2460 (2015) (co-author: Dr. Guoyin Li)



Dr. Xin Guo



Dr. Charles Lee

Long Service Award 2019

Congratulations to the below colleagues who received the Long Service Award in 2019 for their dedicated services with PolyU:

- Ms Ida Man (30 years)
- Dr. Joseph Lee (20 Years)
- Prof. Xiaoqi Yang (20 Years)
- Ms Cynthia Hau (15 Years)

New staff appointment:

Dr. Man-chung Yue, Assistant Professor

- Ph.D., The Chinese University of Hong Kong, 2017
- Research Interests: Nonlinear Optimization Algorithms, Robust Optimization, Mathematical Signal Processing
- Joined AMA in Aug 2019

Retirement and departure

Having served the Department for 20 years, Prof. Liqun Qi, our former Head (June 2007 – June 2013) and the Chair Professor of Applied Mathematics, retired in October 2019. Prof. Qi is conferred as Emeritus Professor upon his retirement.

Dr. Chi Kin Chan, our former Associate Head (July 2010 – March 2019) and Associate Professor retired in July 2019 after 33 years of dedicated service to the University.

We thank both Prof. Qi and Dr. Chan for their wholehearted contributions to the Department and wish them a happy retirement life.

The below colleagues departed from the Department's service recently. We thank them for their service to the Department and wish them every success in their future endeavours.

- Dr. Marjorie Chiu
- Mr. Kent Liu
- Prof. Jian Huang
- Dr. Zhen Pang



Prof. Liqun Qi (left) and Dr. Chi Kin Chan (right)



Charles' sons, Carl (left) and Lewis (right)



Zaikun's daughter, Zhili

New members to the family!

Our warmest wishes to Drs. Zaikun Zhang and Allen Tai who welcomed their new addition to their families in January and April 2020, respectively. We also congratulate Dr. Charles Lee for the arrival of his 2nd son last May.



Allen's son, Aiden

Upcoming Events

PolyU Summer Workshop 2020

Date: 8 August 2020

PolyU Info Day 2020

Date: 10 October 2020

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