

Research Postgraduate Student Programme

by Research Division for Mathematical
and Statistical Science, Faculty of
Science, HKU





Department of Mathematics and Department of Statistics & Actuarial Science

Research Division is a unified platform for mathematical, statistical and actuarial science research with high international visibility and applications leading to impact. The members work closely at all levels, sharing an undergraduate degree, some appointments and numerous research activities.

<https://www.scifac.hku.hk/research/research-divisions-and-units/research-divisions/mns>

Department of Mathematics



A world map silhouette is centered in the upper half of the image, set against a background of a sunset over the ocean. The sky transitions from a deep blue at the top to a bright yellow and white glow at the horizon, with soft clouds. The ocean below is a dark blue with gentle ripples.

An Overview of HKU Math Department

September 2020

Founding Head

Professor Wong Yung Chow (1913-2004)



People

- **18 Professoriate members**
- **3 Lecturers + 2 Assistant Lecturers**
- **11 Postdoctoral Fellows**
- **6-10 incoming Post-Graduate Students each year**
- **25-30 incoming Math Majors each year**
- **15-20 incoming Applied AI (joint with SAAS) Majors each year**
- **50-60 incoming Math Minors each year**

Teaching

- ❖ Algebra I
- ❖ Algebra II
- ❖ Analysis I
- ❖ Analysis II
- ❖ Basic Calculus
- ❖ Basic Applicable Mathematics
- ❖ Multi-variable Calculus
- ❖ Development of Mathematical Ideas
- ❖ Differential Equations
- ❖ Directed Studies in Mathematics
- ❖ Discrete Mathematics
- ❖ Hidden Order in Daily Life
- ❖ Financial Calculus
- ❖ Functional Analysis
- ❖ Functions of a Complex Variable
- ❖ Fundamental Concepts of Mathematics
- ❖ Games and the Mathematical Mind
- ❖ Game Theory and Strategy
- ❖ Geometry
- ❖ Introduction to Topology
- ❖ Introduction to Mathematical Analysis
- ❖ Introduction to Optimization
- ❖ Introduction to Partial Differential Equations
- ❖ Linear Algebra
- ❖ Mathematical Methods for Acturial Science
- ❖ Mathematics Seminar
- ❖ Mathematics Project
- ❖ Mathematics: A Cultural Heritage
- ❖ Matrix Theory and Its Applications
- ❖ Network Models in Operations Research
- ❖ Numbers and Patterns in Nature and Life
- ❖ Numerical Analysis
- ❖ Numerical methods for financial calculus
- ❖ Operations Research I
- ❖ Operations Research II
- ❖ Probability Theory
- ❖ Queuing Theory and Simulation
- ❖ Scientific Computing
- ❖ Topics in Algebra
- ❖ Topics in Mathematical Programming and Optimization
- ❖ University Mathematics I&II
- ❖ Computational Methods and Differential Equations with Applications

Research

Key Areas of World-Class Research:

- **Geometry**
- **Analysis**
- **Number Theory**
- **Optimization and Operations Research**
- **Computational Mathematics**

Geometry



Prof. N. Mok (**Stanford**)
several complex variables, complex
geometry, algebraic geometry



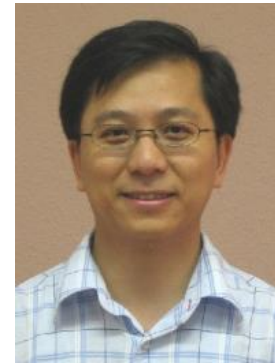
Prof. W.S. Cheung (**Harvard**)
differential geometry, differential
equations, analytic inequalities



Prof. J.H. Lu (**Berkeley**)
Poisson geometry and
Lie theory



Dr. Z. Hua (**Wisconsin**)
algebraic geometry



Prof. T.W. Ng (**HKUST**)
complex analysis, game theory
and mathematical biology

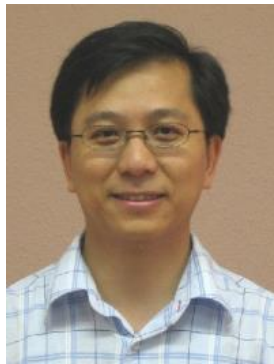
Analysis



Prof. W.S. Cheung (**Harvard**)
differential geometry, differential
equations, analytic inequalities



Prof. N. Mok (**Stanford**)
several complex variables, complex
geometry, algebraic geometry



Prof. T.W. Ng (**HKUST**)
complex analysis, game theory
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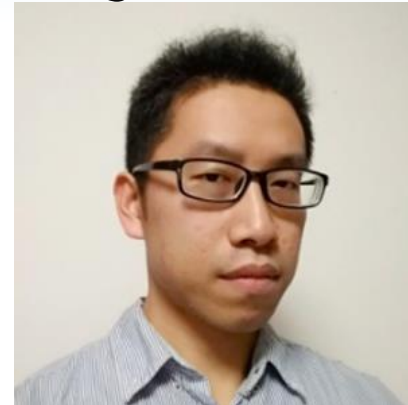


Dr. T. K. Wong (**New York University**)
partial differential equations

Number Theory



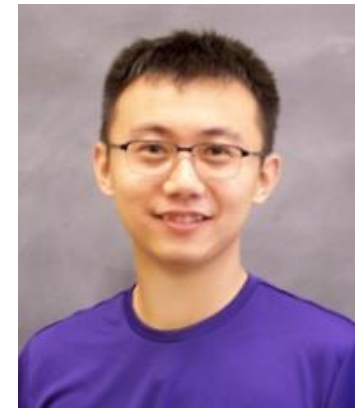
Prof. Y.K. Lau ([HKU](#))
number theory



Dr. Chun Yin Hui ([Indiana](#))
algebraic number theory,
arithmetic geometry



Dr. B. Kane ([Wisconsin](#))
number theory,
combinatorics



Dr. Z. Zhang ([StronyBrook](#))
number theory

Optimization and Operations Research



Prof. W.K. Ching (**CUHK**)
mathematical modeling, applied
computing, optimization



Prof. W. Zang (**Rutgers**)
combinatorics and
optimization



Dr. Z. Qu (**Ecole Polytechnique**)
operations research, optimal
control and optimization



Prof. X.M. Yuan (**CityU**)
numerical optimization and its
applications to AI and scientific
computing

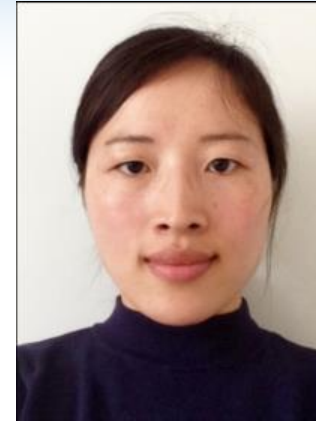
Computational Mathematics



Prof. W.K. Ching (**CUHK**)
mathematical modeling, applied
computing, optimization



Prof. X.M. Yuan (**CityU**)
numerical optimization and its
applications to intelligence and
scientific computing



Dr. Guanglian Li (**Texas A&M**)
numerical analysis,
computational mathematics



Prof. G. Han (**Notre Dame**)
coding and information
theory, cryptography



Dr. Z. Zhang (**Tsinghua**)
scientific computation,
biomechanics



Prof. K.P. Ng (**CUHK**)
scientific computing,
numerical linear algebra

Some Postdocs



Dr. Yuguang Yan
(Postdoctoral Fellow)
machine learning, data mining



Dr. Kwok Kin Wong
(Postdoctoral Fellow)
geometry



Dr. Sudhir Kumar Pujahari
(Postdoctoral Fellow)
number theory



Dr. Dayoon Park
(Postdoctoral Fellow)
number theory



Dr. Minjoo Jang
(Postdoctoral Fellow)
number theory

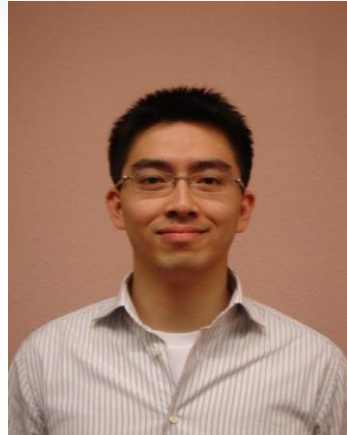


Dr. Sandy Shan Tai Chan
(Postdoctoral Fellow)
several complex variables

Lecturers



Dr. C.W. Wong
analysis and
control theory



Dr. Y.M. Chan
complex, symplectic
and differential geometry



Dr. K.H. Law
combinatorics, graph
theory



Dr. H. Zhang
asymptotic analysis,
integral and differential
equations



Dr. T. W. Ching
number theory

Career Prospects

- ❖ Academia: post-doctoral fellowships and tenure track professorships at major universities in the greater China area and overseas.
- ❖ Industries: R&D positions in high-tech industry, financial industry and so on in the greater China area.

Department of
Statistics & Actuarial Science



Department of Statistics & Actuarial Science



About SAAS

Location: 1/F-3/F, Run Run Shaw Building (RR)
General Office: RR303
IT Office: RR102 (e.g. printing service)
Computer Lab: RR101 and RR103 (e.g. statistical software)
Assignment Box: Outside RR103

People: 18 Professoriate Staff
8 Lecturers
2 Instructors in Statistics
8 Honorary Professoriate Staff (with teaching)
1 Full-time Teaching Assistant
8 Post-Doctor Fellows
38 Research Students
10 Supporting and IT Staff

Departmental website: <https://saasweb.hku.hk/>

Facebook:

<https://www.facebook.com/hkustatisticsactuarialscience>



Golden Jubilee

Established in 1967, SAAS celebrated its 50th anniversary 2 years ago.



Highlights

- Established in 1967, originally as Department of Statistics
- Retitled in 1998 as Department of Statistics & Actuarial Science
- Currently offer **BSc(Majors in Decision Analytics / Risk Management / Statistics)**, **BSc(Actuarial Science)**, **BASc (Applied Artificial Intelligence)**, Master of Statistics, Master of Data Science and MPhil / PhD programmes
- Ph.D. in Statistics was rated as the **No.1** best graduate degree for jobs in 2015, according to Fortune in consultation with the careers site Payscale! The ranking is based on (1) long-term outlook for job growth; (2) median salaries; and (3) job satisfaction scores. Details see [here](#).

Selected Achievements

- According to QS World University Rankings by Subject 2019, HKU Statistics is ranked **No.5 in Asia and No.34 worldwide**.



- HKU Mathematics (*including Statistics and Probability by the definition of the ranking*) ranks **No.9 worldwide** according to the U.S. News & World Report 2014.



- One of the 33 Centers of Actuarial Excellence (CAE) in the world, and one of the only 3 in China/Asia




Recent Awards of Our Current RPGs

- ▶ [SCT Thomas Chalmers Student Scholarship](#) by Society for Clinical Trials, US, by Mr. Chenyang Zhang and Mr. Huaqing Jin in 2020.
- ▶ Current [Hong Kong PhD Fellowship](#) (HKPF) holders:
 - Miss Kexin Lu in 2020
 - Mr. Yunpeng Zhou in 2019
 - Miss Feiqing Huang in 2018
 - Mr. Huaqing Jin in 2018

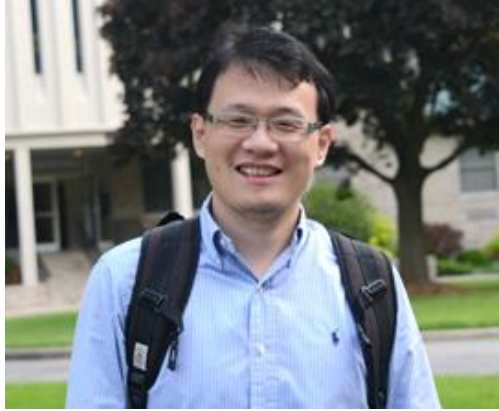
Academic Positions of Our Recent RPG Graduates

- ▶ Assistant professorships received by our RPGs graduated in 2018:
 - Dr. SHI Haolun at [Simon Fraser University](#) and Dr. ZHANG Yiyi at [Nankai University](#).
- ▶ Assistant professorships received by our RPGs graduated in 2017:
 - Dr. LI Zeng at [Southern University of Science and Technology](#), Dr. CHONG Alfred at [University of Illinois at Urbana-Champaign](#), Dr. ZHENG Yao at [University of Connecticut](#), and Dr. ZHU Qianqian at [Shanghai University of Finance and Economics](#).
- ▶ Assistant professorships received by our RPGs graduated in 2016:
 - Dr. LI Zhaoyuan at [The Chinese University of Hong Kong \(Shenzhen\)](#), Dr. WONG Kwok Chuen at [Dublin City University](#), and Dr. LIN Ruitao at [University of Texas MD Anderson Cancer Center](#).

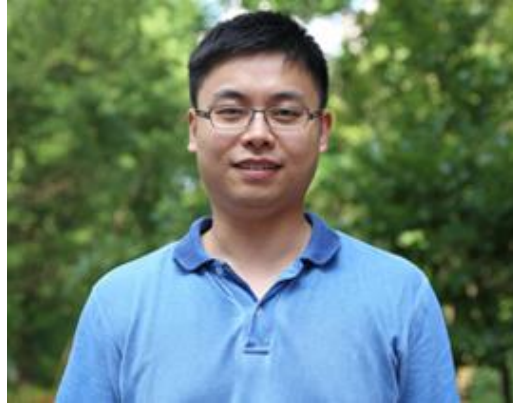
Research areas & Expertise

- ▶ SAAS concentrates on four major research directions, namely:
 - 1) Stochastic Analysis
 - a. Time Series Analysis
 - b. Actuarial Science
 - 2) General Statistical Methodologies
 - 3) Biostatistics and bioinformatics
 - 4) Big Data Science
 - ▶ SAAS has 2 Elected Fellows of [American Statistical Association](#) and 2 Elected Fellows of [Institute of Mathematical Statistics](#), which are top honours for statisticians.
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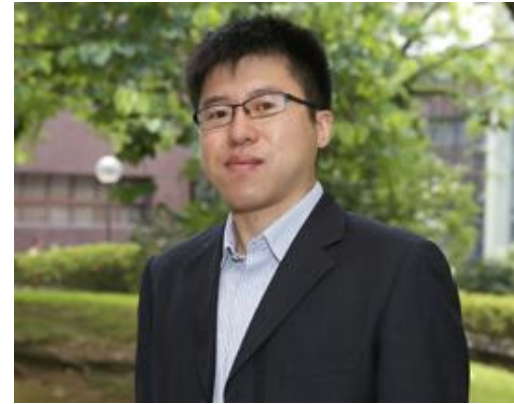
Time Series Analysis



Dr. Guodong Li



Dr. Ke Zhu



Dr. Chen Wang

Actuarial Science



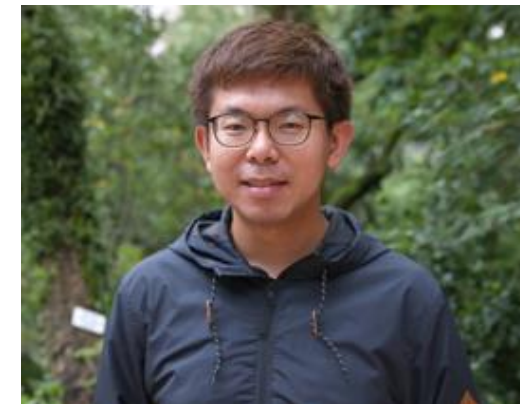
Prof. Hailiang Yang



Prof. KC Yuen

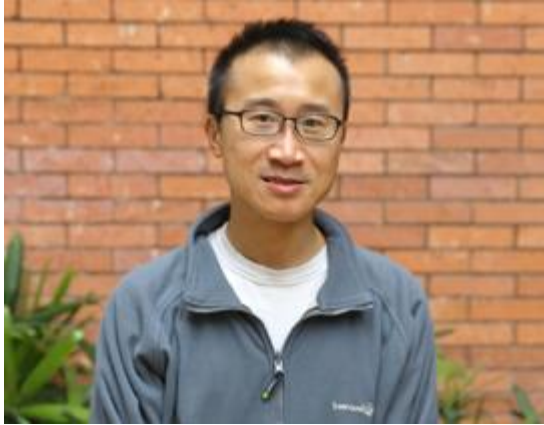


Dr. KC Cheung



Dr. Jeff T.Y. Wong

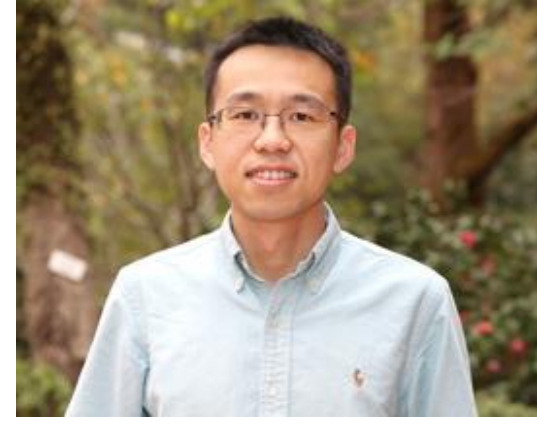
General Statistical Methodologies



Prof. Stephen MS Lee



Prof. Jeff JF Yao

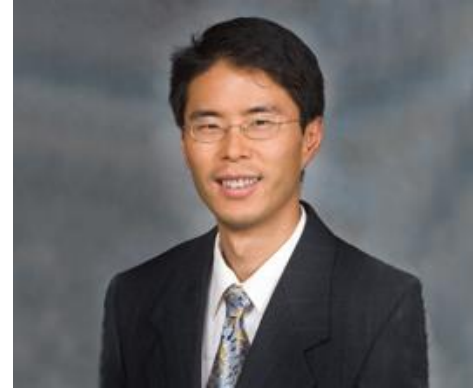


Dr. Wentao Li

Biostatistics and bioinformatics



Prof. WK Fung



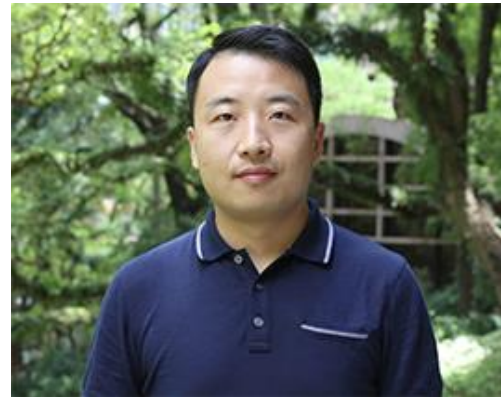
Prof. Guosheng Yin



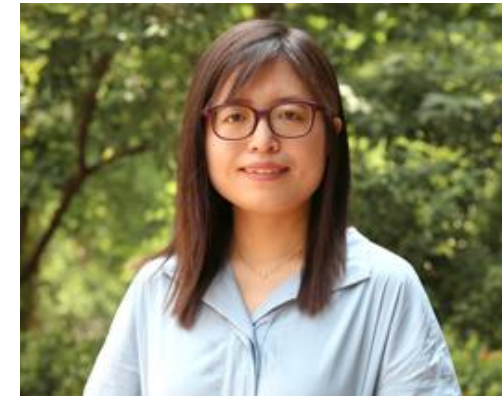
Dr. Eddy KF Lam



Dr. Jinfeng Xu

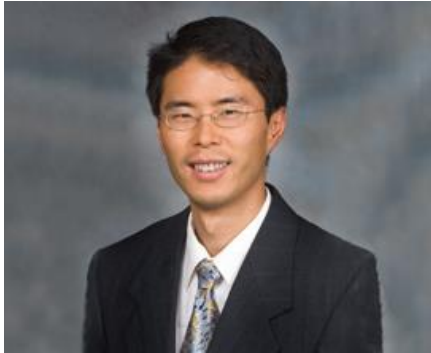


Dr. Zhonghua Liu

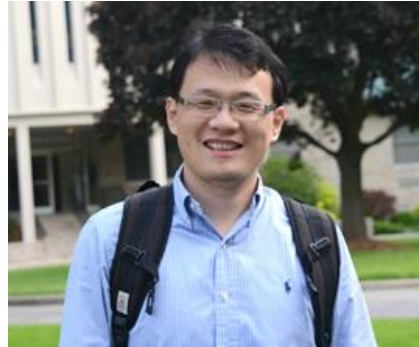


Dr. Dora Y. Zhang

Big Data Science



Prof. Guosheng Yin



Dr. Guodong Li

Research-related activities

- ▶ The following are some of the major research activities of SAAS:
 - SAAS heavily involved in the **59th World Statistics Congress (WSC)** in 2013, one of the largest international conferences in statistics, co-hosted by the **International Statistical Institute (ISI)** and the **Census and Statistics Department, HKSARG**.
 - SAAS members took up major roles on such a special occasion as *Vice Chairperson of Local Organising Committee, Chairperson of Local Programme Committee, Association Representative of the Scientific Programme Committee, etc.*
 - SAAS also organised the **ISI-HKU Short Courses** and **ISI-HKU Young Statisticians' Meeting**, two satellite events of the 59th WSC.

Research-related activities

- *The 5th International Gerber-Shiu Workshop*, an international conference in actuarial science in 2014
- *The 16th International Congress on Insurance: Mathematics and Economics*, a major event for actuarial science in 2012
- SAAS also hosts public lectures from time to time featuring renowned speakers, such as *Howell Tong, Zhiming Ma, Hansjoerg Albrecher, Peter Hall, Jianqing Fan, T.L. Lai, Don Fraser, Elias Shiu, Paul Cheung, Paul Embrechts, etc*

Research is fun

You are most welcome to join us...

Thank you

