

Archive of Actuarial Science Seminars – Michaelmas Term 2020

Wednesday 7 October 2020, 6-7pm - Himchan Jeong

Biography: Himchan Jeong is an Assistant Professor in the Department of Statistics and Actuarial Science at Simon Fraser University, Canada. He is a Fellow of the Society of Actuaries (SOA) and holds a Ph.D. from the University of Connecticut.

He has been actively involved in teaching and conducting research in actuarial science for several years. In recognition for his academic achievements and excellence, he has been awarded the James C. Hickman Scholarship from SOA recently in 2018-2020. His current research interest is predictive modeling for ratemaking and reserving of property and casualty insurance.

Title: Applications of random effects in dependent compound risk models

Abstract: It has been a standard practice to assume, for simplicity, the independence of loss frequency and loss severity in the ratemaking for general insurance. However, in recent years, there is a sporadic interest in the actuarial literature and practice to explore models that depart from this independence assumption. Besides, the availability of data enables us to explore the benefits of using random effects for predicting insurance claims observed over a period of time. In this regard, the following research works are introduced which are related to the modeling of compound risks via random effects.

First, we examine procedures for testing random effects using Bayesian sensitivity analysis via Bregman divergence. It enables insurance companies to judge whether to use random effects for their ratemaking model or not based on observed data. Second, we extend previous work on the credibility premium of compound sum by incorporating possible dependence as a unified formula. In this work, an informative dependence measure between the frequency and severity components is introduced which can capture both the direction and strength of possible dependence.

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Monday 19 October 2020, 6-7pm - Montse Guillen

Biography: Montserrat Guillén is Chair Professor of the Department of Econometrics at the University of Barcelona. Her research focuses on actuarial statistics and quantitative risk management. She has published many scientific articles, contributions to book chapters and books on insurance and actuarial science. She is an associate editor for the Journal of Risk and Insurance – the official journal of the American Risk and Insurance Association, a senior editor of Astin Bulletin – the official journal of the International Actuarial Association, co-editor for the North American Actuarial Journal and was chief editor until 2014 (now associate editor) of SORT-Statistics and Operations Research Transactions. She was awarded by the Casualty Actuarial Society and received the International Insurance Prize. She is a highly cited academic in the field of actuarial science, risk management and insurance. She was President of the European Group of Risk and Insurance Economists, the Geneva Association, in 2011. She has served in boards as well as scientific groups, international programs and steering committees and she has also conducted R&D joint programmes with many companies. She is member of the Royal European Academy of Doctors and Academician of the Real Academia de Ciencias Económicas y Financieras.

Title: Using Telematics in Motor Insurance.

Abstract: Many insurance companies collect telematics data about drivers' exposure to traffic (distance driven and type of road) and their driving behavior (excess speed, aggressiveness, operating hours). Actuaries, who are experts in risk analysis for insurers, use this information to improve the insurance ratemaking process. In addition, personalized driving risk indicators can also promote driving safety. The starting point is data collected from inertial measurement units installed in vehicles, which are then combined with the corresponding records of accidents. We will address the most relevant current challenges in driving risk measurement. Illustrations with several real data sets provided by insurance companies will answer questions: (1) How should pay-per-mile insurance schemes be designed? (2) How can near-miss telematics be used to identify risky drivers? (3) What is the power of risk analytics, percentile charts and reference curves to monitor drivers? We will emphasize the enormous potential of this field to design better insurance products and to improve safety, in general. We will perhaps be able to guess why Tesla is urgently looking for actuaries in the last few weeks.

CANCELLED - Friday 30 October 2020, 9-10.30am - Tan Suee Chieh and Asif John

Biography: Tan Suee Chieh is the President of the Institute and Faculty of Actuaries and member council of IFoA. He sits on the boards of Singapore University of Social Sciences, Sim Kee Boon Institute of Financial Economics (SMU), LSE Trust (Singapore), Singapore School of the Arts and various boards of the Institute and Faculty of Actuaries (UK). He has a first class honours degree from the London School of Economics and Political Science, and a Masters degree from Columbia University, New York.

Biography: Asif John is an Actuary and Data Scientist in the reinsurance sector, with several years of performing in c-level leadership roles within his domain. He is the current Chairman of the IFoA Data Science WP. He also a visiting Guest Lecturer at the London School of Economics and Political Science.

Title: Life as an Actuary

Abstract: Please join us for this Actuarial Science Seminar, Life as an Actuary, by Tan Suee Chieh (President of the IFoA) and Asif John (Chairman of the IFoA Data Science WP). This event will benefit any LSE students who are interested in a career as an actuary. Panellists will speak about their experiences of the actuarial profession, advice for becoming an actuary and the importance of big data. There will also be a Q&A session, so please bring any questions you may have.

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Thursday 19 November 2020, 6-7pm – Sheldon Lin

Biography: Sheldon Lin is a Professor of Actuarial Science at the University of Toronto. He is also an Associate of both the Society of Actuaries and the Canadian Institute of Actuaries. His research interests range from ruin theory, pricing of options and equity-linked annuities, to more recently the risk management of large variable annuity portfolios and statistical modelling for general insurance. He currently serves as an Editor for *Insurance: Mathematics and Economics*.

Title: A Mixture of Experts Regression Models for General Insurance.

Abstract: Understanding the effect of policyholders' risk profile on the number and the amount of claims, as well as the dependence among different types of claims, are critical to insurance ratemaking and IBNR-type reserving. To accurately quantify such relations, it is essential to develop a regression model which is flexible, interpretable and statistically tractable.

In this talk, I will begin with a brief discussion on modelling philosophy from a personal perspective and then introduce a highly flexible nonlinear regression model for multivariate claim frequencies and severities with the modelling philosophy. This model is interpretable and able to fit any types of claim data accurately which in turn will minimize the issue of model selection, and it can be estimated by an EM algorithm.

Model implementation is illustrated by a simulation study and a real data application. The real data application involves fitting the multivariate claim frequency data from a European auto insurer. The model enables us to interpret the fitting in an insurance perspective and to visualize the relationship between policyholders' information and their risk level, as well as the usefulness for insurance ratemaking. I will also briefly describe a R package we have developed for this model.

Tuesday 24 November 2020, 6-7pm – Sonal Shah

Biography: Sonal Shah is a Fellow of the Institute and Faculty of Actuaries (IFoA). She is an Education Actuary at the IFoA, working on various education projects, including professionalism, along with being a member of some IFoA General Insurance committees. She also co-chairs a staff Diversity and Inclusion Group. Sonal has been an active volunteer for the profession for several years, and she continues to volunteer for The Actuary magazine. She is currently a member of the Editorial Advisory Panel, and was a features editor for a few years and has written several articles for the magazine. She is also a Board member of the charity Actuaries Without Borders. Prior to working at the IFoA, she spent a few years as a freelance actuarial consultant helping a variety of insurance clients with regulatory projects, in particular to enhance actuarial documentation. Her previous jobs include working for the UK regulator and a large global consultancy. Sonal read BSc Actuarial Science at the London School of Economics and Political Science.

Title: Professionalism, Puzzles and Pointers.

Abstract: This presentation will cover professionalism (ethics and codes of conduct with case studies), puzzles (maths/logic problems with a focus on non-technical skills used to solve them) and pointers (tips and useful information for actuarial internships, graduate roles and careers).

Tuesday 1 December 2020, 6-7pm – Dimitris Karlis

Biography: Dimitris Karlis is Professor at the Department of Statistics, Athens University of Economics and Business (AUEB). He received a BSc. in Statistics from Department of Statistics, AUEB in 1992 and a PhD in Statistics from the same department in 1999. He has been elected as assistant professor since 2004. He has published approximately 80 papers in peer reviewed statistical journals. His research interest refer to mixture models, computational statistics and especially stochastic algorithms, multivariate count data analysis, models for statistical analysis for sports data and modeling dependent data via copulas. He is Associate editor of *Metron* journal, *Communications in Statistics (both Theory and Methods and Computation and Simulation)*, *IMA Journal of Management Mathematics and Stochastic Environmental Research and Risk Assessment*, while he has acted as referee for more than 135 papers. He is also editor of *Biometrics Bulletin of IBS*. He has supervised 4 PhD student, 18 Master thesis, while at this moment he supervises one PhD student. He has been invited in several conferences around the world. He is member of the American Statistical Society, elected member of the International Statistical Institute, member of the International Association of Statistical Computing, publicity officer of the Eastern Mediterranean Region of the International Biometrics Society and member of the Greek Statistical institute. He has also participated in several European projects related to statistics and mainly to official statistics. He was recently awarded the XII Insurance Award “Ferran Armengol i Tubau” from the Catalan Economic Society (<http://www.ub.edu/riskcenter/2019/05/30/bermudez-and-karlis/>)

Title: Bivariate Ratemaking models for counts.

Abstract: A typical problem in actuarial literature relates to ratemaking, i.e. to calculate a fair premium for the policyholders based on their characteristics. While the literature on the univariate case, i.e. when one type of claims is treated is vast, less is developed for the case of bivariate/multivariate counts, i.e. when more types of claims are examined together and hence the cross-correlation needs to be taken into account. To this direction, this talk aims at presenting some models and new results towards ratemaking for multiple type of claims. In particular we present models that can take into account issues like time dependence and cross dependence that have been treated as separate entities so far. We have developed models to take them into account together. Applications with real data will be discussed.

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Archive of Actuarial Science Seminars – Lent Term 2021

Wednesday 3 February 2021, 8-9pm – Jules Gribble and Asif John

Biography: **Jules Gribble** has over 30 years' experience in professional financial services as an actuary, policy setter and educator. He has published over 60 professional papers and delivered many presentations and training programs, as well as establishing several successful actuarial consulting firms. He is currently serving his second term as a member of the Council (Board) of the Australian Institute of Actuaries, has represented Australia on the IAA's Advice and Assistance Committee, and is also a graduate member of the Australian Institute of Company Directors (GAICD).

Biography: **Asif John** has over 20 years of experience in the Insurance and Re-Insurance sector coupled with multiyear experience of performing leadership roles in his domain. A qualified Actuary, he is the CEO of ARGenesis Consultancy Management and is proud to be the current Chairman of the IFoA Data Science WP/MIG. This role also includes being part of the IFoA Board on the Data Science Steering Committee, contributing strategy branding for the IFoA for all areas.

Abstract: In this seminar about the actuarial profession, we'll cover the actuarial contribution compared with data scientists, technical and professional actuarial paradigms, analytic control cycles, and implementing actuarial value.

Wednesday 10 February 2021, 6-7pm – W. Jean Kwon

Biography: Professor Kwon holds the EAG Manton Chair Professorship in International Insurance and Risk Management at the School of Risk Management (SRM), St. Joh's University, New York. Besides his full-time professorial commitment, he assists the International Insurance Society, the Center for the Study of Insurance Regulation, Asia-Pacific Journal of Risk and Insurance, Financial Accreditation Agency, Singapore College of Insurance, Network Financial Institute and other organizations and intergovernmental agencies around the world. Since the early 1990s, he has been an educator also with Georgia State University (US) and Nanyang Technological University (Singapore), insurance regulator with the Monetary Authority of Singapore and industry specialist with the American Institute for CPCU/IIA (now the Institutes).

He studied risk management and insurance at The College of Insurance (now the SRM) and Georgia State University. He specializes in insurer/market/country analysis, regulation and critical issues in product and market development.

Title: Commercial use of parametric insurance.

Abstract: This seminar offers a comprehensive review of parametric insurance from a contractual viewpoint. We propose a new categorization of parametric insurance. It outlines the benefits and concerns of parametric insurance in comparison to indemnity-principle based insurance, and discuss the regulatory compliance matters. There has been a rise of innovative parametric insurance solutions in recent years covering a wide range of risks and serving clients—individuals, businesses and governments. This seminar surveys the current global market and identifies areas where insurance and reinsurance companies can play important roles in offering or supporting parametric insurance operations.

Wednesday 17 February 2021, 6-7pm – Asif John

Biography: Asif John has over 20 years of experience in the Insurance and Re-Insurance sector coupled with multiyear experience of performing leadership roles in his domain. A qualified Actuary, he is the CEO of ARGenesis Consultancy Management and is proud to be the current Chairman of the IFoA Data Science WP/MIG. This role also includes being part of the IFoA Board on the Data Science Steering Committee, contributing strategy branding for the IFoA for all areas.

Title: Micro-placements, internships and career opportunities for 2nd and 3rd year BSc Actuarial Science students.

Abstract: About micro-placements, internships and its detail in what it takes to become successful in the insurance industry.

Wednesday 3 March 2021, 6-7pm - Meera Devlia

Title: Hymans Robertson - Actuarial Opportunities

Abstract: In this seminar we will discuss opportunities for Actuarial Science students at Hymans Robertson. The talk will be given by recent graduate Meera Devlia (Investment Analyst), Karyn Cooke (Actuary) and Noosha Razaghi (Actuary).

Hymans Robertson provide independent pensions, investments, benefits and risk consulting services, as well as data and technology solutions to a range of clients.

Wednesday 10 March 2021, 5.30pm - 6.30pm, Margie Rosenberg

Biography:

Margie Rosenberg, PhD, FSA is the Assurant Health Professor of Actuarial Science at the University of Wisconsin-Madison. Her research interests are in the application of statistical methods to health care, and applying her actuarial expertise to cost and policy issues in health care. Her recent research involves linking social determinants to outcomes such as (i) assessing the impact of delayed attention to oral health issues on emergency department visits and (ii) assessing the impact of unhealthy behaviors on perceived health status and predicting individuals with persistent high expenditures. Her research is published in the NAAJ, as well as health services and clinical journals.

Title: A Clustering Approach using Social Determinants to Identify Profiles of US Children and their Families with Low Dental Expenditures and High Medical Expenditures

Abstract: Oral health in children can be easily maintained with preventive care such as regular dental appointments that include cleanings, sealants, and fluoride treatment. Dental insurance is generally separate from medical insurance in the US, but there is coverage for children under the Medicaid program and the Affordable Care Act. In this work we explore, using an unsupervised clustering method, the similarities and differences of children based on their characteristics and their family compositions who have low dental expenditures and high medical expenditures. There is evidence that oral health is connected to long-term overall health in adults. Specifically for children, poor oral health can lead to self-esteem and poorer school performance. We find that increasing the number of clusters chosen can be more illustrative of characteristics of vulnerable families. In our presentation, we will share preliminary results of our study.

Wednesday 24 March 2021, 6-7pm - Sonal Shah

Biography: Sonal Shah is a Fellow of the Institute and Faculty of Actuaries (IFoA). She is an Education Actuary at the IFoA, working on various education projects, including professionalism, along with being a member of some IFoA General Insurance committees. She also co-chairs a staff Diversity and Inclusion Group. Sonal has been an active volunteer for the profession for several years, and she continues to volunteer for The Actuary magazine. She is currently a member of the Editorial Advisory Panel, and was a features editor for a few years and has written several articles for the magazine. She is also a Board member of the charity Actuaries Without Borders. Prior to working at the IFoA, she spent a few years as a freelance actuarial consultant helping a variety of insurance clients with regulatory projects, in particular to enhance actuarial documentation. Her previous jobs include working for the UK regulator and a large global consultancy. Sonal read BSc Actuarial Science at the London School of Economics and Political Science.

Title: Internships, Graduate Roles and Actuarial Careers

Abstract: This seminar will cover helpful hints and tips on how to gain internships and graduate roles, and an overview of actuarial careers.

Monday 10 May, 2-3pm - Andreas Tsanakas

Biography: Andreas Tsanakas is a Professor in Risk Management at the Business School (formerly Cass), City, University of London. His research interests are in quantitative risk management, with particular focus on sensitivity analysis, capital allocation and model uncertainty. He is a co-organiser of the Insurance Data Science Conference and Editor-in-Chief of the Annals of Actuarial Science.

Title: Multivariate Stressing of Risk Models - Joint work with Ruodu Wang and Pietro Millosovich

Abstract: For decision makers whose portfolios are exposed to functions of a random vector of risk factors, we consider a *stress* to be a change of measure, placing a higher weight on scenarios of interest. In particular, we define a *stressing mechanism* as a mapping from risk factors to Radon-Nikodym densities. We formulate desirable properties for stressing mechanisms in the context of applications such as sensitivity analysis of economic capital models, capital allocation, and importance sampling. We focus on stressing mechanisms that are invariant in the marginal distributions of risk factors and demonstrate alternative constructions with different sets of properties. We present analytical examples, emphasising the impact of stressing on the (joint) tails of distributions and conclude with a numerical study of a real non-life insurance portfolio.