R in Insurance

Paris, 8th June 2017

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Contents

Welcome to the 5th R in Insurance conference

We are delighted to welcome you to the 5th édition of **R in Insurance** conference, at École Nationale de la Statistique et de l'Administration Économique (ENSAE).

This one-day conference will focus once more on applications in insurance and actuarial science that use R, the lingua franca for statistical computation. Topics covered range from insurance pricing and econometric modelling, to data science, computation and the use of R in a production environment. All topics are discussed within the context of using R as a primary tool for insurance risk management, analysis and modelling.

The conference programme consists of invited talks and contributed presentations discussing the wide range of fields in which R is used in insurance.

We hope that you will find the conference enjoyable and stimulating.

The organizing committee


Nicolas Baradel


Christophe Dutang


Caroline Hillairet

Thanks

An event like this is not possible without the help of many. Our special thanks go to:

- The scientific committee: Arthur Charpentier (Université de Rennes), Christophe Dutang (Université du Maine), Markus Gesmann (Vario Partners), Giorgio Alfredo Spedicato (UnipolSai Assicurazioni) and Andreas Tsanakas (Cass Business School) ;
- The Centre National de la Recherche Scientifique (CNRS), the Centre de Recherche en Economie et en Statistique (CREST) and the Laboratoire Manceau de Mathématiques (LMM) for their administrative support ;
- The ENSAE for its administrative support and for hosting the event.

We are grateful to our sponsors: RStudio, Verisk, Barnett Waddingham, Milliman and Mirai Solutions; Scientific chairs: actinfo and Régulation et Risques Systémiques. Without their generous support, this conference would not have been possible.

Programme

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(Julie Seguela, *Covéa*)

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- R as a Modelling Tool for Life Insurers (Aman Sanganeria *Ernst & Young*)

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- A catastrophe model for insurance losses due to freeze events using vine copulas
(Symeon Koumoutsaris, *Guy Carpenter*)
- Individual claims reserving: a survey (Alexandre Boumezoued, *Milliman Paris*)
- The GeDS R package: Geometrically Designed Variable-Knot Splines in the context of GLM(GNM) modelling (Andrea Lattuada, *Università di Trieste*)

15:05 - 15:30 Coffee break

15:30 - 16:30 Session 4: Life Insurance
- SimBEL: Calculate the best estimate in life insurance with Monte-Carlo techniques
(Quentin Guibert, *Prim'Act and ISFA*)
- Stochastic Programming for Asset Allocation in Pension Funds
(Iegor Rudnytskyi, *Université de Lausanne*)
- Modelling expert judgement through fuzzy logic in R
(Victory Idowu, *London School of Economics and Political Science*)

16:30 - 17:20 Closing Keynote Session:
Recent developments in micro-level reserving (Katrien Antonio, *KULeuven*)

18:00 - 20:00 Free tour at Musée d'Orsay

20:00 - 22:00 Dinner at Musée d'Orsay

Abstracts

Opening Keynote Session (09:10 - 10:00)

Textual analysis of expert reports to increase knowledge of technological risks

Julie Seguela (Covéa)

Data are more and more accessible in an open way. In insurance industry, open data are a powerful source of information, helping increasing risk knowledge.
In this context, we found open data from ARIA database (Analysis, Research and Information about Accidents), which has collected more than 40 000 technological accidents, mostly between 1995 and 2015 in France, susceptible to damage public health or safety, environment, agriculture, etc. We have access to expert reports detailing circumstances, causes and consequences of these accidents.
In addition to the covering of risks, insurers can provide services to their customers to improve retention. For professional customers, this could mean offering new services in order to prevent technological risks.
To analyse and extract information from these unstructured data (reports), we will use text mining techniques and some helpful visualization packages.
In particular, we will show how R can help to identify and categorize most frequent circumstances and causes in each industry thanks to clustering techniques. This talk will also highlight how various R packages can interact to achieve our goal.

Session 1: Big Data (10:00 - 11:00)

General insurance claim modelling with factor collapsing and bayesian model averaging in R

Sen Hu (University College Dublin)

General insurance pricing involves analysis of past claims data as well as different properties of the insured objects and the corresponding policyholders. Generalized linear models (GLMs) have become the industry's standard approach for modelling risks of this nature. However, the GLM approach utilizes a single "best" model on which pricing outcomes and loss predictions are based, which can involve subjective decisions as to the inclusion or exclusion of variables that are borderline significant. An additional characteristic of most general insurance datasets is the presence of many categorical variables, each with multiple levels, which can adversely affect the parsimony of the model and the interpretability and communicability of its results. In particular, not all levels of each factor variable may be required or statistically significant, and rather some subsets of the factor levels may be merged to give a smaller overall number of levels. This problem is more obvious when the number of levels within a factor is high.
We propose a method for assessing the optimal manner of collapsing a factor with many levels into one with a smaller number of levels, and using Bayesian model averaging (BMA) to blend predictions from all reasonably good models arising under every possible collapsed form of the factor in question. In this way, the parsimony of the models and the interpretability of their results will also be improved. This method will be very computationally intensive considering the number of factors being collapsed simultaneously, as well as the possibly large number of levels within each of those factors. Hence a stochastic optimization search is proposed to find the best few collapsing cases across the model space before BMA is used. This method has been implemented in R, sample code and results are provided for an illustrative data set of car insurance.

Network Analytics in Claims Level Predictive Modelling

Marcela Granados (Ernst & Young) and **Satraajeet Mukherjee**

Insurance companies deal with a lot of unstructured claims data in their day-to-day activities. Companies that use predictive analytics at the claim level can gain earlier and more insights into drivers of changes such as changing exposure mix, claims handling practices, etc. Often times, the changing environment

leads to changing predictors within the data. These constant changes require an ongoing analysis of key predictive variables (structured data) such as cause of injury. Further key predictors can be extracted from unstructured data such as claims narratives, to improve the predictive power of the models. External factors such as state regulations, changing demographics, etc. affect insurance claims, often invalidating the assumptions of traditional reserving techniques and leading to large adverse development. A large global insurer has recently experienced significant adverse development, affecting its earnings and stock prices.
This research study explores the use of Natural Language Processing and Deep Learning Techniques using R packages for building claim level predictive models, by leveraging unstructured claims data. We use text mining packages in R to organize the data into a Corpus for further processing and manipulation using Network Analytics. We then use Deep Learning techniques for advanced pattern recognition within the data in order to optimally identify the most powerful predictors.
The model performance is assessed based on how well the model captures the key features in the data, and how it uses this information to form new claim predictions. The presentation will also cover the use of RShiny and visual analytics capabilities within R to analyze text data and assess model performance. The choice of the optimal model will be based on 1) the statistical testing of the model 2) visual representation of the model performance and 3) impact on the business.

Opening the Black Box with Machine Learning in R

Jean-Bernard Crozet (MS Amlin)

The catastrophe reinsurance market relies on sophisticated modelling and technical pricing techniques to assess risks and optimise portfolios.
One of the main issues with this "black-box complexity" is that the results are not always intuitive to the users, and it is often hard to distinguish between the "wrong" and the "complicated".
We have used machine learning techniques in R to open the black box and reduce that complexity. For instance, this approach has helped identify the key drivers of risk and technical prices.
We would like to present how our analyses have helped understand and communicate to stakeholders.

Session 2: Lighting talks (11:30 - 12:30)

Pricing Long Term Care Insurance with the markovchain R Package

Giorgio Spedicato (UnipolSai Assicurazioni)

The markovchain package in a R library that provides useful methods and function for modeling Markov processes. In particular it is possible to handle (defining, importing, plotting) discrete time Markov chains (DTMC), perform structural analysis of the DTMC probabilistic structure (e.g. the classification of states), and fitting DTMC from empirical data. A LTC insurance can be seen as a non - homogeneous DTMC, since it is possible to associate a transition matrix between the Health, Disablead and Death state to each attained age. The markovchain package handles such probabilistic structures as well.
A brief overview to the markovchain package's cababilities will be given as introduction. Then, using data from a recent study on the Italian population it will be shown how the markovchain package can be used to perform actuarial analyses on LTC insurances, directly using a stochastic approach. In particular applications for pricing and reserving will be shown.

Non life pricing: empirical comparison of classical GLM with tree based Gradient Boosted Models

Leonardo Petrini (Hopenly)

Classical GLM are currently the standard approach to price non life insurance risk. Nevertheless, in recent times tree based boosted models (GBM, XGBoost) have attracted major attention in many fields, including the acturial science. In this work we present an empirical comparison between the GLM approach, and

gradient boosted models such as GBM, and XGBoost. GLM modelling is performed with the use of mgcv and cplm packages, that allow take advantage of splines for continuous predictors. On the other hand, GBM and XGBoost modelling is performed via the H2O infrastructure, and the xgboost package respectively. Separate modelling of frequency and severity, as well as direct modelling of risk premium through Tweedie distribution is performed, using a real dataset coming from a MTPL Insurer. Features include details on the vehicle, driver, and claim history.

Solution for Technical Provisions in R

Gabriel Foix (Mirai Solutions)

Technical provisions form the backbone of an insurer's balance sheet. They are typically the largest item on the balance sheet and constitute a key input to the Solvency Capital Requirement calculation. The Solvency II requirements – in particular those for technical provisions – are more demanding compared to IFRS/GAAP or earlier Solvency regimes and will become even more challenging in the upcoming IFRS 17 model. Under Solvency II, technical provisions consist of the present value claim provisions, premium provisions, and risk margin. According to the EIOPA specifications, the present value of cash flows is calculated by applying a payment pattern to the undiscounted reserves in order to generate future cash flows that are discounted and summed. Furthermore, the regulatory authorities require the use of sound processes to ensure the quality, accuracy, reproducibility, and auditability of technical provisions calculations. In this context, insurance companies are facing the challenge to build modern, scalable, flexible, and user-friendly processes that enable the actuaries to focus on the final results, rather than being encumbered by complex, time-consuming, and error-prone processes. In the presentation, we will show in detail an elegant solution in R for implementing an integrated technical provisions solution that meets the challenges described above. This work is part of a larger project carried out by Mirai Solutions for a global insurer.

Systematic Data Exploration with dataexpks

Cooney Mick (Barnett Waddingham)

One of the first tasks performed in many data analysis projects is data exploration. In this presentation, I discuss a new package 'dataexpks' - the data exploration kick-starter – pronounced 'data expects'.
This Rmarkdown template systematises the first basic exploratory tasks performed with a new dataset, along with a few visualisations and assessments for missing data and cleanliness as well as performing some standard dimensionality reducing visualisation on the numeric data in the dataset.

R as a Modelling Tool for Life Insurers

Aman Sanganeria and **Ed Bujok-Stone** (Ernst and Young)

Currently the medium/small insurers struggle to bear the cost of the expensive life modelling platforms and make do with makeshift informal Excel based/VBA models which do not have enough programming capabilities. Hence a low cost efficient formal modelling platform that already has life insurance and financial packages for valuations could do wonders for them.
R proves to be a great fit for this purpose. It is already an established platform for analytics, and Shiny is a powerful tool for deploying R's data visualization capabilities. We have taken the modelling capabilities in R a step forward and designed a prototype tool in R (& R Shiny) to perform the regular reserving and pricing activities of life insurers. This tool provides useful functions that allow the life actuary to perform these regular tasks like estimating cashflows, liabilities, profits as well as demographic analysis. Also, stochastic evaluations can be performed in addition to standard deterministic calculations.
This talk will cover: How to use R in modelling traditional Life Products ; Illustration of the Actuarial assessment of a protection product and Potential further uses of R in Life Insurance

We provide a demo of the user interface developed in R Shiny. The interface is flexible to take inputs from the user and dynamically makes changes to the result using reactivity in R, thereby saving the user time.

Session 3: Non-life Insurance (13:45 - 15:05)

Sparse modeling of risk factors in insurance analytics

Sander Devriendt (KULeuven)

Insurance companies use predictive models for a variety of analytic tasks, including pricing, marketing campaigns, claims handling, fraud detection and reserving. Typically, these predictive models use a selection of continuous, ordinal, nominal and spatial risk factors to differentiate risks. Such models should not only be competitive, but also interpretable by stakeholders (including the policyholder and the regulator) and easy to implement and maintain in a production environment. That is why current actuarial literature puts focus on generalized linear models where risk cells are constructed by binning risk factors up front, using ad hoc techniques or professional expertise. In statistical literature penalized regression is often used to encourage the selection and fusion of predictors in predictive modeling. Most penalization strategies work for data where predictors are of the same type, such as LASSO for continuous variables and Fused LASSO for ordered variables. We design an estimation strategy for generalized linear models which includes variable selection and the binning of risk factors through L1-type penalties. We consider the joint presence of different types of covariates and a specific penalty for each type of predictor. Using the theory of proximal operators, our estimation procedure is computationally efficient since it splits the overall optimization problem into easier to solve sub-problems per predictor and its associated penalty. As such, we are able to simultaneously select, estimate and group, in a statistically sound way, any combination of continuous, ordinal, nominal and spatial risk factors. In this talk, we will show how R was used in this research to create a performant, reliable and accessible tool for researchers and practitioners.

A catastrophe model for insurance losses due to freeze events using vine copulas

Symeon Koumoutsaris (Guy Carpenter)

The main goal of catastrophe models is to help to estimate the full spectrum of probability of loss for a specific portfolio comprised by several residential, auto, commercial or industrial risks. This requires to consider not only each risk separately but also (and more importantly) how all risks relate to each other and their potential synergy to create catastrophic losses. However, the high dimensionality of the problem poses a big challenge for multivariate copula methods. Vine copulas provide a flexible solution to this problem based on a pairwise decomposition of a multivariate model into bivariate copulas. This approach is very flexible, as the bivariate copulas can be selected independently for each pair, from a wide range of (parametric) families, which enables to model a wide range of complex dependencies. In addition, R packages CDVine and VineCopula have been recently developed, which implement the vine copula theory in a very efficient and automatic way and also provide several functions for bivariate and multivariate analysis. In this paper, I use those R packages to develop a catastrophe model on insurance losses due to pipe bursts resulting from freeze events in the United Kingdom.

Individual claims reserving: a survey

Alexandre Boumezoued (Milliman Paris)

In this talk, we will review individual claims reserving models from their mathematical foundations to their practical implementation. In a first part, we will introduce a mathematical framework which aims at unifying micro-level modelling techniques by means of Poisson point measures. In a second part, we will detail some micro-macro consistency results linking individual reserving models (using detailed claims records) with macro-level approaches (based on aggregate triangles). On this basis, we will highlight the

main key mathematical common features and differences between micro and macro approaches. Finally, we will discuss the practical implementation using R of a micro level model on a real individual claims dataset, in particular the calibration of the parameters and the forecasting of key quantities of interest. Practical comparison with traditional techniques based on aggregate triangles will be provided. Joint work with R&D and P&C teams at Milliman Paris.

The GeDS R package: Geometrically Designed Variable-Knot Splines in the context of GLM(GNM) modelling

Andrea Lattuada (Università di Trieste)

We present a new R package named GeDS, which implements Geometrically Designed Splines (GeDS) with variable knots within the framework of GLM(GNM) modelling. The latter models are a generalization to the Exponential Family of the GeDS recently developed by Kaishev et al (2016) for the case of normally distributed responses. The GeDS R package is illustrated based on both simulated and real data examples from insurance and other fields and thoroughly compared with existing competitors among which Semi-parametric Models (SPM), Generalized Smoothing Spline ANOVA models (GSS) and Generalized Additive Models (GAM). In particular, we illustrate how GeDS is used to model mortality data and claims reserving data.

Session 4: Life Insurance (15:30 - 16:30)

SimBEL: Calculate the best estimate in life insurance with Monte-Carlo techniques

Quentin Guibert (Prim'Act and ISFA)

Under the Solvency II regime, the market-consistent value of life insurance liabilities is determined by calculating a best estimate as the expected present value of future payments generated by insurance contracts. This calculation considers financial options and guarantees included in the insurance obligations, and future management actions. In particular, the profit sharing mechanism of the insurance portfolio is one of the key elements of this modeling. However, developing a valuation approach for this purpose is difficult as this requires specific models for a joint projection of assets and liabilities, including lots of management and contractual rules. We propose the SimBEL package in R for the valuation and the analysis of the best estimate related to a portfolio of euro-denominated savings contracts with profit participation, which are the most common product on the French insurance market. This package (not yet available on the CRAN repository) uses Monte-Carlo simulation techniques and covers the main steps of the analysis of a such valuation model, in a manner similar to commercial software commonly used by actuaries. It requires providing insurance data and the output of an economic scenario generator with a standard data format, and can be used to compute the main shocks defined by the standard formula, as it includes functions dedicated to data preparation for this purpose. This presentation aims to describe the framework behind this package, its usage and some implementation details.

Stochastic Programming for Asset Allocation in Pension Funds

Iegor Rudnytskyi (Université de Lausanne)

Stochastic programming (SP), as alternative to a common choice of Monte-Carlo (MC) simulation methods, has been shown as a powerful approach for asset and liability management (ALM) of pension funds and life insurance companies. While MC seeks for a "sufficiently good" solution, SP returns an approximation of the true optimal solution, which makes SP superior to MC in many contexts. However, SP requires significantly more efforts (both in computational and mathematical terms) when compared to more easily treatable MC methods. The SP multistage problem formulation heavily relies on a concept of a scenario tree, which represents the evolution of stochastic parameters (e.g., future performance of economy, demographic variables, etc.), that are typically represented by time series models. Such scenario trees allow to convert the SP problem to an approximated deterministic formulation, which typically stays

in a linear framework. In our work, we list the methods of generating the scenario tree mostly used in practice and we focus on a bracket-mean method. Then, we investigate the convergence towards the optimal solution with respect to the bushiness of the scenario tree. Furthermore, the sensitivity of the optimal solution to the changes in a planning horizon and a target wealth is analyzed. For our ALM scenarios we fit historical data to time series model. Finally, we compare the performance of SP and MC approaches by means of a simple example allowing as to provide practical insights and conclusion. All procedures of estimating statistical parameters are established in R language, which is considered as a most commonly applied in industry. However, R is known to be not the best choice for optimization problems as of today. We discover limits of R and its packages for linear optimization, as well as R in conjunction with GLPK library, as a tool for solving large-scale optimization problems.

Modelling expert judgement through fuzzy logic in R

Victory Idowu (London School of Economics and Political Science)

Under the Solvency II framework, all insurance firms are required to specify the correlations between all the risks that may affect their solvency as well as the method used in estimating these correlations. In order to comply with the Solvency II regulations, many insurance companies rely on expert judgment to estimate the correlations between risks when there is insufficient data to numerically quantify them.
A current method used by a firm to estimate a correlation between two risks will be to use their panel of experts in order to come to an agreed estimate. Each expert brings their own opinion to the panel. Hence, it is neither known how to robustly model their opinions nor calculate the sensitivity of their beliefs to the output.
We used the principles from a specific kind of mathematical set theory called fuzzy logic to propose a model for the expert's opinions and calibrate the value of the correlation.
We have constructed the new model in R and conducted a sensitivity analysis from the perspective of a theoretical multinational insurer interested in examining the correlation of a mass lapse of insurance policies between two of its business units.

Closing Keynote Session (16:30 - 17:20)

Recent developments in micro-level reserving

Katrien Antonio (KULeuven)

To be able to fulfill future liabilities insurance companies will hold sufficient capital reserves. Loss reserving deals with the prediction of the remaining development of reported, open claims (the reported but not settled reserve) and unreported claims (the incurred but not reported reserve). Accurate, reliable and robust reserving methods for a wide range of products and lines of business are a key factor in the stability and solvability of insurance companies. Micro-level reserving approaches the reserving problem by using granular, detailed data on the development of individual claims. In this talk we give an overview of the research on micro-level reserving. We present ongoing developments in this field, highlight their possible strengths but also weaknesses, and formulate current challenges. We pay specific attention to the structure of micro-level data, and the use of statistical modeling and data analytic tools for reserving with granular data. We illustrate our talk with case-studies.

Biographies of speakers

Opening Keynote Session (09:10 - 10:00)

Julie Seguela (Covéa)

Julie is a data scientist at Covea. She holds a master degree in Statistics and a PhD in Applied Statistics and Machine Learning from the Conservatoire National des Arts et Métiers, where she has been focusing on applying text mining techniques and recommender systems to the field of employment. After five years in start-up environments working with R on web and textual data, she contributed as a consultant to the development of a high performance computing platform based on R. Julie then joined Covea and now investigates in what extent machine learning techniques can help to improve risk understanding and selection.

Session 1: Big Data (10:00 - 11:00)

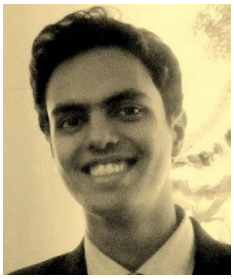
Sen Hu (University College Dublin)

Sen is a second-year PhD student in Statistics based jointly at School of Mathematics and Statistics at University College Dublin, and Insight Centre for Data Analytics UCD. His current PhD work focuses on using predictive analytics to develop and improve approaches to insurance pricing modelling, both non-life and life. He obtained his BSc in mathematics from University of Edinburgh, and a MSc in Statistics from Imperial College London, where his thesis was on improving accurate approximate Bayesian computation (ABC) with optimal hypothesis test. He is also a co-author of the R package "abc.star" on calibration procedures for accurate ABC. After the MSc he then worked as a data scientist in visual science at City University of London for one year before he started his doctoral studies in Ireland.

Marcela Granados (Ernst & Young) with Satraajeet Mukherjee

Marcela Granados is a key asset of the Actuarial Analytics practice of Ernst & Young and has more than 10 years of experience working in the insurance industry in both Commercial and Consumer lines in all actuarial areas (Predictive Modeling, Pricing and Reserving). During the past 6 years, she has led large and complex analytics projects, such as applying machine learning techniques to disability models, building lapse models using behavioral analytics, and leveraging unstructured data. Marcela is a Fellow of the Casualty Actuarial Society ("CAS"), serves on the CAS Committee on Reserves and is a certified R programmer. Marcela has presented on a variety of modeling and non-traditional reserving to industry audiences and has been featured in actuarial magazines.

Satraajeet Mukherjee (Ernst & Young) with Marcela Granados



Satraajeet is a consultant working in the actuarial and analytics team of EY. He is an Associate of the Institute and Faculty of Actuaries and has around 3 years of experience working on various areas of general insurance including reserving, pricing, capital modelling and insurance analytics. Apart from data science, his interests include swimming and writing poems.

Jean-Bernard Crozet (MS Amlin)

JB Crozet is Head of Underwriting Modelling for MS Amlin, a specialty (re)insurer part of the MS&AD Group. His role and responsibilities include setting the direction for the Underwriting Modelling function, which covers Catastrophe Modelling, Exposure Management & Technical Pricing.
JB has over 20 years of experience in global (re)insurance, having held various actuarial and underwriting positions in the London and Bermuda markets prior to joining Amlin in 2009.
He is a Fellow of the Institute of Actuaries (FIA), a Chartered Financial Analyst (CFA) and a Fellow of the Royal Statistical Society (FSS).

Session 2: Lighting talks (11:30 - 12:30)

Giorgio Spedicato (UnipolSai Assicurazioni)

Giorgio A. Spedicato works as Data Scientist at Unipol Group in Italy, where he applies predictive modeling techniques across a wide range of business projects. Before UnipolSai, he worked as Reserving and Pricing P&C actuary for the Italian branches of Axa and Aviva Insurance Groups. He is the author and maintainer of three R packages: lifecontingencies, markovchain and mbbefd. He is Fellow of the Casualty Actuarial Society, the Society of Actuaries and the Royal Society of Statistics and holds a Ph.D in Actuarial Science.

Leonardo Petrini (Hopenly)

Leonardo is a passionate Data Scientist with strong Machine Learning skills. He has a MSc degree in Statistics from the University of Warwick, and has worked since graduation as a consultant for a major Italian insurer, on several projects including policy pricing optimisation. You can reach him at leopetrini@mail.com.

Gabriel Foix (Mirai Solutions)

Gabriel Foix is a Senior Consultant with more than 10 years of experience in data analytics for financial companies.He studied economics and quantitative finance. His professional background is in the banking industry, with a focus on regulatory developments such as Basel II and financial modelling. In his current position at Mirai Solutions, Gabriel has been involved in several consulting projects for the Insurance industry, where he has designed and implemented technical solutions mainly in the Economic Capital area. Most of the code written during these engagements is done in R. In his free time Gabriel enjoys running and other outdoor sport.

Cooney Mick (Barnett Waddingham)

Mick's background is in physics and quantitative finance and has been working in the insurance industry for about three years. He is interested in all applications of data and statistics to insurance, particularly in the use of Monte Carlo simulation and Bayesian analysis.

Aman Sanganeria (Ernst and Young) with Ed Bujok-Stone

Aman has 2 years of experience at Ernst & Young. He is currently working as an Actuarial Analyst. During his experience at EY he has worked on model validation of various life insurers. He has also been involved in modelling frequency and severity of Cyber Attacks. Outside of work his interests include tennis, cricket & sports news.

Ed Bujok-Stone (Ernst and Young) with Aman Sanganeria

Ed is a senior manager from the EY EMEIA Risk and Actuarial services. He leads our modelling research and development group in the UK. He has assisted European insurers, asset managers and pension funds with their liability and asset modelling capability.

Session 3: Non-life Insurance (13:45 - 15:05)

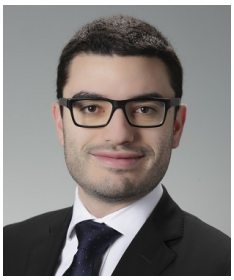
Sander Devriendt (KULeuven)

Sander Devriendt joined the Accountancy, Finance and Insurance research group of KU Leuven in 2015 as a doctoral researcher. He is also connected to the Leuven research center for insurance and financial risk (LRisk). His research is supervised by professor Katrien Antonio and supported through the Ageas CE research chair in insurance analytics. He completed the applied mathematics master as well as the actuarial masters at KU Leuven. The main focus in his research is the application of advanced statistical methods and machine learning techniques in both life and non-life insurance, in particular mortality modeling, pricing and loss modeling.

Symeon Koumoutsaris (Guy Carpenter)

Symeon (Simos) Koumoutsaris works as a catastrophe model developer in Guy Carpenter. Apart from developing probabilistic models for natural perils (e.g. hail, flood), he is responsible for the in-house loss computation platforms. He enjoys programming in R, which he frequently uses in his daily work. Before joining Guy Carpenter, Simos has also spent 3 years in Risk Management Solutions, where he has been involved on the development of the Japan Typhoon model and RMS(one). Simos holds an MSc in Atmospheric Chemistry and Physics from the L.I.S.A. in Paris and a PhD in atmospheric sciences at the E.P.F.L. (Switzerland) where he studied the interannual variability of tropospheric ozone. As a post-doc in the International Space Science Institute in Bern, Switzerland, his research focused on a wide range of topics related to atmospheric sciences, such as water and energy atmospheric transport, cryosphere mass balance, climate feedbacks and others. In his spare time, he loves running, playing football, and reading.

Alexandre Boumezoued (Milliman)



Alexandre Boumezoued is Senior Consultant in the Research & Development team in Milliman Paris office, covering technical risks modelling topics in life and non-life insurance. Alexandre's research interests deal with stochastic micro/macro reserving models, stochastic population dynamics and its use for longevity risk purposes, as well as data reliability issues for biometric risks assessment. During the last years, he has given talks in around 30 international conferences and working groups worldwide, and courses in several actuarial centers. Alexandre is member of the French ANR project "Dynamic models for longevity with lifestyle adjustments" (Lolita). He received his PhD in Applied Mathematics from Paris 6 University (Probability and Random Models Laboratory), for which he has been awarded by the SCOR Actuarial Prize 2016.

Andrea Lattuada (Università di Trieste)

Andrea Lattuada received both the B.S. and the M.S. from the School of Banking, Finance and Insurance of the Catholic University of Milan. Andrea received his PhD in Management and Actuarial Sciences in 2017 from the Universities of Udine and Trieste with a dissertation about "Some Developments in Flexible Regression Modelling". Andrea is currently involved in research projects with the University of Trieste and the Cass Business School and he is collaborating with the Catholic University of Milan.

Session 4: Life Insurance (15:30 - 16:30)

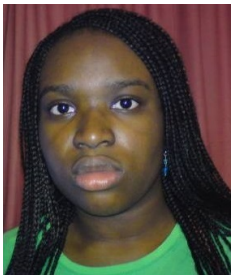
Quentin Guibert (Prim'Act and ISFA)

Quentin Guibert is a postdoctoral researcher at ISFA (Université Lyon 1, Laboratory of Actuarial and Financial Sciences) and a member of the ANR Lolita project. He is also an actuarial consultant at Prim'Act and a member of the French Institute of Actuaries.

Iegor Rudnytskyi (Université de Lausanne)

Iegor is a second-year PhD student in the research group of Professor Joël Wagner at HEC, University of Lausanne. Carrying a BSc and MSc in Applied Mathematics, Iegor also obtained a MSc in Actuarial Science from University of Lausanne. Apart from his mathematical background, he did an internship in an IT company. His current scientific interests include risk management, risk theory, ALM, and loss models.

Victory Idowu (London School of Economics and Political Science)



Victory is a graduate fellow of the Royal Statistical Society and a part-qualified actuary, member of the Institute and Faculty of Actuaries. She has produced publications in risk management and is currently preparing a PhD in the Statistics department of the London School of Economics and Political Science (LSE). Victory also holds a BSc in Actuarial Science and a MSc in Statistics (Research) from the LSE. For further research enquiries, please contact: v.idowu@lse.ac.uk

Closing Keynote Session (16:30 - 17:20)

Katrien Antonio (KULeuven)

Katrien Antonio (°1981) studied mathematics at KU Leuven (Belgium). She currently works as an associate professor at both KU Leuven and the University of Amsterdam. Katrien is co-director of the Leuven Research Center in Financial and Actuarial Risk Analysis (LRisk). Katrien's research puts focus on predictive modeling for actuarial science and quantitative risk measurement. She teaches courses on life and non-life insurance mathematics and loss models. 'Using R' takes a prominent role in these courses.

Notes

Timeline

9:00 - 9:10	Welcome speech
9:10 - 10:00	Opening Keynote Session
10:00 - 11:00	Session 1: Big Data
11:00 - 11:30	Coffee break
11:30 - 12:30	Session 2: Lighting talks
12:30 - 13:45	Lunch
13:45 - 15:05	Session 3: Non-life Insurance
15:05 - 15:30	Coffee break
15:30 - 16:30	Session 4: Life Insurance
16:30 - 17:20	Closing Keynote Session
18:00 - 20:00	Free tour at Musée d'Orsay
20:00 - 22:00	Dinner at Musée d'Orsay