

Invitation to a Course on Current Challenges in Actuarial Data Science

25th and 26th September 2020
live broadcast

Keynote Speakers: Dr. Jonas Hirz, Actuary AVÖ (Actuarial Association of Austria)
Consultant at Boston Consulting Group, Vienna
Chairperson of the Data Science working group of the AVÖ
Member of the Data Science/AI workstream of the Actuarial Association of Europe

Dr. Mario Hörig, Actuary DAV (German Association of Actuaries)
Partner at Oliver Wyman, Dusseldorf

Onnen Siems
Managing partner and co-founder
Meyershole Siems Kohlruss actuarial consulting company, Cologne
Chairperson of the association VM4K e.V., Cologne

Carina Götzen, Actuary DAV (German Association of Actuaries)
Leading consultant
Meyershole Siems Kohlruss actuarial consulting company, Cologne

Lecturers: Prof. Dr. Marcus Hudec
Faculty of Computer Science, Vienna University
Director of Data Technology, Vienna
Visiting professor at Salzburg University

Dr. Michael Schlögl, Actuary AVÖ (Actuarial Association of Austria)
Head Actuary and Actuarial Function Non-Life
Wiener Städtische Versicherung AG – Vienna Insurance Group, Vienna
Chairperson of the mathematical-statistical committee of the
Austrian Association of Insurance Companies
Visiting professor at Salzburg University

Andreas Missbauer, Actuary AVÖ (Actuarial Association of Austria)
Deputy Actuarial Function Non-Life
Wiener Städtische Versicherung AG – Vienna Insurance Group, Vienna
Visiting professor at Salzburg University

Dates: Friday, 25th September 2020, 9.00 – 16.30
Saturday, 26th September 2020, 9.00 – 12.15

Contents: Against the background of digital transformation and new technological possibilities, the insurance industry and especially actuaries are faced with the challenge of successfully integrating analytical procedures and methods of data science and artificial intelligence into existing business models or using them to contribute to the development of new innovative business models.

Data Science is a collective term for methods and approaches that are important in the transition to a data-centric company. The still young profession of a data scientist requires both a broad analytical-methodological basic knowledge from the fields of statistics and computer science as well as specific knowledge from the application domain in the insurance industry. Accordingly, an emphasis is placed on application scenarios in the insurance industry.

The lectures by renowned experts will highlight the practical relevance of the topic in the insurance industry and the resulting strong pressure for change in the industry from different perspectives. Furthermore, concrete application examples will be presented, and the possible embedding of data science in the business model will be demonstrated.

For continuing professional development (CPD) the course counts as 9 hours. The course also meets the requirements by the Austrian Financial Market Authority with respect to the (deputy) responsible actuary (§§ 114 – 116 Austrian Insurance Supervision Act as well as §§ 21d and 21e Austrian Pension Fund Act), the head of the actuarial function (§ 113 Austrian Insurance Supervision Act as well as § 21c Austrian Pension Fund Act), the head of the risk management function (§ 112 Austrian Insurance Supervision Act as well as § 21a Austrian Pension Fund Act) and other management, governance or key functions (§ 120 Austrian Insurance Supervision Act as well as § 21 Austrian Pension Fund Act).

The course is designed not only for actuarial students, but also addresses experienced actuaries. The emphasis will be on a practical and data-oriented approach. A basic stochastic knowledge is sufficient. The course differs significantly from the course “Advanced Statistical Methods in Insurance” in previous years. Please find the detailed programme on the following page.

Course fees: € 384 (incl. VAT).

Information: For further information, please contact Sarah Lederer (sarah.lederer@sbg.ac.at) by e-mail with your telephone number. Your questions will be answered as soon as possible.

Registration: Please send the attached registration form by e-mail (sarah.lederer@sbg.ac.at) or by post, and arrange for the amount to be transferred (at no cost to the recipient) to the following account before 4th September 2020:

Salzburg Institute of Actuarial Studies (SIAS)
IBAN: AT79 2040 4000 0001 2021 BIC: SBGSAT2S

Modalities: The lectures will be held as a live broadcast, participants will receive the necessary information in due course.

Programme

Session 1	9.00 – 10.30
Session 2	10.45 – 12.15
Session 3	13.15 – 14.45
Session 4	15.00 – 16.30

Friday, 25th September 2020

1 **Overview on data science methods in actuarial practice** (*Jonas Hirz*)

This keynote will focus on the demystification of data science in the actuarial context (terminology, data scientist vs. actuary, evolution of our profession), on use cases in the insurance industry (examples along the value chain) and on the future of data science and the role of the actuary (customer of the future, insurtechs, tech giants, international developments).

2 **Deep learning techniques** (*Mario Hörig*)

Neural networks and their applications in insurance risk management will be presented with examples and case studies (proxy modelling, dimension reduction/clustering, multidimensional real-world simulation of market risk factors).

3 **Scoring of telematics data in motor insurance** (*Onnen Siems and Carina Götzen*)

Telematics data such as time-dependent acceleration and geolocation values are recorded during car rides at high frequency, thus generating very large amounts of data (Big Data), which by far exceed the data volumes usually used for setting up a tariff. Promising applications such as principal component analysis and heatmaps in combination with generalized linear models are presented.

4 **Generalized linear models and clustering for tariff calculations** (*Andreas Missbauer*)

Presentation of a practical example of motor insurance pricing using a multiplicative generalized linear model (implemented in R) on the basis of freely available real data and of an application of clustering using the example of regional pricing in accident insurance.

Saturday, 26th September 2020

1 **Further data science applications in the insurance industry** (*Michael Schlögl*)

Simulation of bonus-malus systems (short summary from the course "Fundamental Statistical Methods in Actuarial Data Science"), market comparison of bonus-malus systems, campaign optimization, sales reporting, stochastic simulation in life insurance.

2 **Algorithm-based supervised learning** (*Marcus Hudec*)

Starting with simple tree procedures, random forests as well as methods of bagging and boosting are explained on the basis of concrete application examples. A discussion of the frequently used algorithms k-nearest neighbors and collaborative filtering rounds off the topic.