

Title

Quantifying Uncertainty for AI-based Solvency Capital Estimation

Speaker/Company

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Abstract

In the evolving landscape of insurance mathematics, the computation of Solvency Capital Requirements (SCR) under the Solvency II framework presents a significant challenge, especially for life insurance companies due to their complex risk profiles and vast computational demands. This presentation delves into an innovative approach for forecasting the SCR that integrates the Least-Squares Monte Carlo (LSMC) method with neural network models, enhancing the efficiency and accuracy of SCR estimations.

We start with a detailed overview of the Solvency II framework, emphasizing its impact on the calculation of SCR and the heightened computational strain it places on life insurance firms. The session then introduces the LSMC method, detailing its application in SCR estimation and how it can be optimally combined with advanced machine learning techniques. We will particularly focus on specific types of neural networks tailored for this application, offering a glimpse into their potential to revolutionize traditional actuarial practices.

One of the critical challenges in this integration is ensuring the reliability of forecasts and quantifying uncertainty. Our presentation addresses these challenges head-on, discussing the inherent drawbacks of existing forecasting models and proposing more robust methods to measure and manage prediction uncertainties effectively. We will showcase preliminary results demonstrating the potency of these methods in providing accurate, reliable SCR forecasts. By attending this presentation, actuaries will gain insights into cutting-edge methodologies that are set to redefine SCR estimation processes. We aim to equip both proficient and aspiring actuaries with knowledge and tools that not only streamline SCR computations but also enhance the overall reliability and precision of solvency assessments in the insurance sector.

Biography

Mark-Oliver Wolf:

Nov. 2023 - Present: PhD Student of Prof. Ralf Korn, topic: "Mathematical and Machine Learning Aspects of the Solvency Capital Requirement Calculation."

Mar. 2022 - Present: Applied Researcher in Actuarial and Financial Mathematics at Fraunhofer ITWM

2017 - 2022: B.Sc. and M.Sc. in (Actuarial and Financial) Mathematics at Technische Universität Kaiserslautern
