Doctoral School of Information and Biomedical Technologies Polish Academy of Sciences

Subject

Simulation of rare catastrophic events for description of insurer's portfolio

Supervisors, contact, place of research

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Project description

The classical approach in insurance mathematics assumes occurrence of many losses, which have only small and limited influence on a whole portfolio of an insurer (like, e.g., in the case of automobile crashes). Whereas, together with a progress of climate changes, number of rare events with severe, catastrophic consequences increases (e.g., floods which affect many insureds at a flooded region at once). In the literature, simulation approaches, which enable sampling from a random distribution describing rare and catastrophic events in numerically efficient way, are known (e.g., the splitting or the importance sampling). Unfortunately, published real data is frequently incomplete or censored. This severely hampers a process of a selection and a fitting of respective random distributions to value of the losses. The main aim of the project is to develop and apply simulation methods for rare and catastrophic events, which have an impact on insureds, together with an attempt to numerically compare insurer's portfolios, which are constructed using various types of financial-insurance instruments, both the classical and the more modern ones (e.g., reinsurance contracts and catastrophe bonds).

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