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*Lognormal convolutions and their applications*

Computing the distribution of a sum of independent lognormally distributed random variables is a hard problem that has many important applications in Actuarial Science. I will present a new algorithm for approximating the sums of independent and lognormally distributed random variables; this algorithm actually works for a more general class of Generalized Gamma Convolutions. By merging tools from probability theory and numerical analysis, we are able to compute the cumulative distribution functions of the just-mentioned sums with any desired precision. Our algorithm is fast and can tackle equally well sums with just a few or thousands of summands. The effectiveness of the new method will be illustrated in the contexts of the individual and collective risk models, aggregate economic capital determination, and economic capital allocation. This talk is based on joint work with Ed Furman and Dan Hackmann.