Mathematics, Statistics, and Computer Science **@ UIC**

Statistics and Data Science Seminar

A flexible Bayesian nonparametric model for predicting future insurance claims

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Abstract: Accurate prediction of future claims is a fundamentally important problem in insurance. The Bayesian approach is natural in this context, as it provides a complete predictive distribution for future claims. The classical credibility theory provides a simple approximation to the mean of that predictive distribution as a point-predictor, but this approach ignores other features of the predictive distribution, such as spread, that would be useful for decision-making. Unfortunately, these other features are more sensitive to the choice of loss model and prior distribution, so a flexible nonparametric Bayesian model is desirable. In this paper, we propose a Dirichlet process mixture of log-normals model and discuss the theoretical properties and computation of the corresponding predictive distribution. Numerical examples demonstrate the benefit of our model compared to some existing insurance loss models, and an R code implementation of the proposed method is also provided.

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