

Commercial Automobile Insurance: A Practical Approach of the Generalized Additive Model

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Abstract : The insurance industry is usually not the first topic one has in mind when thinking about applications of data science. However, the use of data science in the finance and insurance industry is growing quickly for several reasons, including an abundance of reliable customer data, ferocious competition requiring more accurate pricing, etc. Among the top use cases of data science, we find pricing optimization, customer segmentation, customer risk assessment, fraud detection, marketing, and triage analytics. The objective of this paper is to present an application of the generalized additive model (GAM) on a commercial automobile insurance product: an individually rated commercial automobile. These are vehicles used for commercial purposes, but for which there is not enough volume to apply pricing to several vehicles at the same time. The GAM model was selected as an improvement over GLM for its ease of use and its wide range of applications. The model was trained using the largest split of the data to determine model parameters. The remaining part of the data was used as testing data to verify the quality of the modeling activity. We used the Gini coefficient to evaluate the performance of the model. For long-term monitoring, commonly used metrics such as RMSE and MAE will be used. Another topic of interest in the insurance industry is to process of producing the model. We will discuss at a high level the interactions between the different teams with an insurance company that needs to work together to produce a model and then monitor the performance of the model over time. Moreover, we will discuss the regulations in place in the insurance industry. Finally, we will discuss the maintenance of the model and the fact that new data does not come constantly and that some metrics can take a long time to become meaningful.

Keywords : insurance, data science, modeling, monitoring, regulation, processes

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