

Insurance Prediction Analysis Using Machine Learning in Python

Literature Survey

In [1], Rama Devi Burri, Ram Burri, Ramesh Reddy Bojja, Srinivasa Rao Buruga have presented several machine learning techniques to analyse the insurance claims efficiently and compare their performances using various metrics. They have mentioned different algorithms those are useful to built the data model for mining the data in different ways. As the result they made conclusion that, Logistic Model Tree (LMT), Random Forest algorithms have given better results when compared with Naïve Bayes Updatable, Naïve Bayes, Multi-Layer Perceptron and Random Tree Algorithms.

In [2], Roel Henckaerts^{2,4}, Marie-Pier Côté¹, Katrien Antonio^{2,3,4}, and Roel Verbelen, have stated that they have adapted tree-based machine learning to the problem of insurance for pricing evaluation. Their tree-based techniques can be used on insurance data, but care has to be taken with some statistical assumptions in the form of the loss function choice. They have used the Poisson and gamma deviance because the classical squared error loss is not appropriate for a frequency-severity problem. They have used the R programming to define the different functions to predict the different outcomes for the datasets.

In [3], Jean-Yves Rioux, FCIA, FSA, CERA, Deloitte Arthur Da Silva, ACIA, FSA, Deloitte Harrison Jones, ASA, Deloitte Hadi Saleh, Deloitte, have concluded that they have used predictive analysis for data which is based on the people from certain region. Depending upon the interviews taken by their survey team they have stated some parameters to predict the analysis. Based on their questionnaires' they have collected the data from number of customers to predict the outcome according the data provided to the model. They have considered the large number of parameters which may not be very useful for calculating the precise values.

In [4], Maximizing Customer Lifetime Value using Stacked Neural Networks: An Insurance Industry Application paper, they proposed a two-stage neural network architecture. The Stage-I neural network uses a self-attention mechanism and a Metric Learning (CML) to generate product recommendations. The Stage-II neural network uses a neural network-based survival analysis to infer insurance product recommendations that maximize customer lifetime. Their technique manages to model the non-linear

relationships of user's preferences through the neural network survival method, providing an edge when compared to other linear survival analysis methods.

References:

1. Insurance Claim Analysis Using Machine Learning Algorithms by Rama Devi Burri, Ram Burri, Ramesh Reddy Bojja, Srinivasa Rao Buruga International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8, Issue- 6S4, April 2019
2. A data driven binning strategy for the construction of insurance tariff classes Roel Henckaerts, Katrien Antonio, Maxime Clijsters and Roel Verbelen
3. The Use of Predictive Analytics in the Canadian Life Insurance Industry
4. Maximizing Customer Lifetime Value using Stacked Neural Networks: An Insurance Industry Application
5. Hallak A., Y. Mansour, and E. Yom-Tov, "Automatic representation for lifetime value recommender systems," arXiv preprint arXiv:1702.07125, 2017.
6. W.-C. Kang and J. McAuley, "Self-attentive sequential recommendation," in 2018 IEEE International Conference on Data Mining (ICDM). IEEE, 2018, pp. 197–206.