UPM
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INSPEM WEEKLY SEMINAR

16/2018

Date & Time

18th May 2018, Friday @ 3.15 pm

Venue

Al-Farabi Seminar Room, Second Floor, INSPEM

Presenter

Prof. Dr. Stefan Lessmann
Visiting Scientist
Laboratory of Computational Statistics and Operations Research

Topic

Novel Perspectives on Credit Scoring for Profitability Objectives

Abstract

Binary scoring model are widely used to support lending decisions in consumer finance. Applications such as predicting repayment behavior, the future state of an account, offer acceptance probability or customer churn exemplify their use in industry and academia. Some previous literature has questioned the way in which corresponding scorecards are estimated from data and called for a stronger consideration of profit-oriented criteria during scorecard development. The paper expands this stream of literature. In particular, we concentrate on the Expected Maximum Profit (EMP) measure and develop a modeling framework that organizes scorecard estimation so as to maximize EMP. In addition, the proposed framework offers automatic feature selection and the determination of a classification cut-off. These modeling steps are also performed in a profit-maximizing manner and without compromising the comprehensibility of the final scoring model. To achieve this, the proposed model draws inspiration from logistic regression and augments the linear scoring function by introducing an elastic-net regularization penalty. The advantage of this penalty is that it combines the variable selection capability of the LASSO penalty with the robustness of the ridge penalty toward multicollinearity. To determine the parameters of the resulting model, namely the regression coefficients and two regularization parameter, we employ a genetic algorithm using the EMP as fitness function. Testing the potential of the proposed framework through a set of empirical experiments using multiple real-world credit scoring data set, we observe the novel approach to perform competitive to state-of-the-art scoring methods in terms of standard performance indicators such as the AUC, and better in terms of the EMP. In this sense the results further support the view that economic indicators of prediction model performance should not only be used for model assessment but also play a role in model development. Furthermore, the paper proposes a specific approach how to organize and implement such a business-driven model development paradigm.