

Latent Network Information-Enhanced Credit Risk Prediction

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Given the sheer size of the consumer credit market and the huge number of consumer credit users, credit risk prediction, or how to predict delinquent (or default) probabilities of consumer credits to aid financial institutions in granting and managing consumer credits, has become a critical problem in the consumer credit industry. While it is desirable to employ both users' intrinsic and social network data for effective credit risk prediction, it is difficult to collect social network data. To address this challenge, we propose to use latent network information instead of social network data. Accordingly, we develop a novel credit risk prediction model that considers both users' intrinsic data and latent network information. We then design a new credit risk prediction method that estimates the model parameters, learns latent network information, and integrates this information with users' intrinsic data for credit risk prediction. We further extend our method to the multiclass and numerical credit risk prediction problems. Extensive empirical evaluations with real world data demonstrate the superior predictive power of our method over benchmark methods for a broad spectrum of credit risk prediction problems (binary, multiclass, and numerical). We also show substantial economic value generated from the superiority of our method through a case study.

Key words: credit risk prediction, latent network information, machine learning, information systems:
enabling technologies
