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Data-Driven Risk Modeling in Insurance: A Machine Learning Perspective

Communication Info

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Abstract

The growing availability of heterogeneous insurance data enables improved risk assessment methodologies. Traditional actuarial models remain limited in capturing nonlinear relationships and temporal dependencies present in real-world data [1]. This paper proposes a data-driven framework for insurance risk modeling using advanced machine learning techniques.

The approach analyzes structured and time-dependent data, employing Long Short-Term Memory (LSTM) networks to model temporal dynamics and probabilistic methods to quantify uncertainty and improve robustness [2], [3]. Experimental results demonstrate improved prediction accuracy and generalization compared to conventional approaches [4]. The integration of machine learning and applied mathematics provides an effective and scalable solution for modern insurance analytics and decision-making [5].

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