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A Matrix Factorization Approach to Predicting Successful Commercial Real Estate Development Partnerships

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Proposed commercial real estate development projects have a significant impact on the current and future landscape of cities. Despite the high completion rates of projects, a significant number go uncompleted with significant ramifications to cities' economies.

In this paper, we propose a recommender systems based algorithm to predict the completion rate of projects proposed by developer, architect pairings. We recast the problem as the following recommender systems question - at what rate will the pairing of an owner and an architect lead to completed projects? Equivalently, we ask - how does an owner rate an architect? Matrix Factorization via stochastic gradient descent is shown to learn the completion rates of project collaborators. Methods in mining imbalanced datasets are also used to boost the accuracy of the algorithm. Experiments on a real dataset show a 44% improvement over assuming (as currently is the case) that every pairing will be successful. The method red flags several projects of high economic value.

The main contribution of the paper is the usage of collaborative filtering and imbalanced dataset techniques in the mining of commercial real estate data.