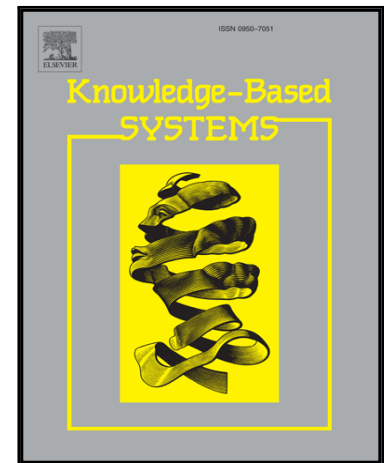


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A decision support system for detecting serial crimes

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Abstract

Serial crimes pose a great threat to public security. Linking crimes committed by the same offender can assist the detecting of serial crimes and is of great importance in maintaining public security. Currently, most crime analysts still link serial crimes empirically especially in China and desire quantitative tools to help them. This paper presents a decision support system for crime linkage based on various, including behavioral, features of criminal cases. Its underlying technique is pairwise classification based on similarity, which is interpretable and easy to tune. We design feature similarity algorithms to calculate the pairwise similarities and build up a classifier to determine whether a case pair should belong to a series. A comprehensive case study of a real-world robbery dataset demonstrates its promising performance even with the default setting. This system has been deployed in a public security bureau of China and running for more than one year with positive feedback from users. The use of this system would provide individual officers with strong support in crimes investigation then allow law enforcement agency to save resources, since the system not only can link serial crimes automatically based on a classification model learned from historical crime data, but also has flexibility in training data update and domain experts interaction, including adjusting the key components like similarity matrices and decision thresholds to reach a good tradeoff between caseload and number of true linked pairs.

Keywords:

Serial crimes; Crime linkage; Pairwise case linkage; Robbery; Hierarchical similarity;

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