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Application of rough sets and Dempster-Shafer's evidence theory in spatial data mining

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This paper presents a novel approach to spatial classification and prediction of land cover classes using rough set and evidence theory. In particular, it presents an approach to characterizing uncertainty in multisource supervised classification problem. The evidential structure of spatial classification is founded on the notions of equivalence relations of rough set. It allows expressing spatial concepts in terms of approximation space wherein a decision class can be approximated through the partition of boundary region. A key advantage of this approach is that it allows incorporating the context of spatial neighborhood interactions and the combination of multiple spatial evidences. The empirical result demonstrates that the model classifier's predictive performance significantly improves the accuracy of classification. A comparison of the predictive performance of the model with the radial basis function-based artificial neural network algorithm shows that the predictive performance of the proposed model is significantly better than neural network model.

Biography

Iftikhar U Sikder is an Associate Professor jointly appointed in the Department of Information Science, Department of Electrical Engineering and Computer Science at Cleveland State University, USA. His research interests include soft computing, granular computing, data mining and collaborative decision support systems. His papers appeared in the *Journal of Risk Analysis*, *Expert Systems with Applications*, *International Journal of Mobile Communications*, *Information Resources Management Journal*, *International Journal of Management & Decision Making*, and *International Journal of Aerospace Survey and Earth Sciences*. He has authored many book chapters and presented papers in many national and international conferences.

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