

**Density-based Place Clustering Using Geo-Social Network Data**

**Abstract:**

Spatial clustering deals with the unsupervised grouping of places into clusters and finds important applications in urban planning and marketing. Current spatial clustering models disregard information about the people and the time who and when are related to the clustered places. In this paper, we show how the density-based clustering paradigm can be extended to apply on places which are visited by users of a geo-social network. Our model considers spatio-temporal information and the social relationships between users who visit the clustered places. After formally defining the model and the distance measure it relies on, we provide alternatives to our model and the distance measure. We evaluate the effectiveness of our model via a case study on real data; in addition, we design two quantitative measures, called social entropy and community score, to evaluate the quality of the discovered clusters. The results show that temporal-geo-social clusters have special properties and cannot be found by applying simple spatial clustering approaches and other alternatives.