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Shaoyu Li*, sli23@uncc.edu, **Yanqing Sun**, yasun@uncc.edu, **Liyang Diao**, ldiao@serestherapeutics.com, and **Xue Wang**, wang.xue@mayo.edu. *Distance-based analysis with quantile regression model.*

Suitable pairwise distance measure which defines how dissimilar any two samples are can be used to study the association between multivariate, especially non-vectorially structured multivariate data, which are emerging in many important research areas including genomics, ecology, and neuron imaging. In this work, we consider a quantile regression model for matrices of pairwise distance. We derive large sample properties of estimators in the model and propose corresponding statistical inference procedure. Intensive simulation studies illustrate great finite sample characteristics of the proposed method in terms of accurate coverage probability, and well controlled empirical type I error rate. Finally, we apply our method to re-analyze a Microbiome association study and a plant ecological study to illustrate its utility. (Received August 27, 2018)