WAKE FOREST
U N I V E R S I T Y

Department of Statistical Sciences

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Dear Editor:

Please find the manuscript enclosed entitled: "Partitioned Local Depth (PaLD) Community Analyses in R", to be submitted by Lucy D'Agostino McGowan, Katherine Moore, and Kenneth Berenhaut as an original manuscript for *The R Journal* under the *Packages* designation. All of the co-authors have worked collaboratively on the contents of this manuscript and have no financial interests to report. This manuscript is original and has not been previously published.

Partitioned Local Depth (PaLD) is a framework for a holistic consideration of community structure for distance-based data. Leveraging a socially inspired perspective, the method provides network-based community information which is founded on a new measure of local depth and pairwise cohesion (partitioned local depth). The method is distinct from commonly used methods and does not require distributional assumptions, optimization criteria, nor extraneous inputs. The details about the method itself were recently published in the *Proceedings of the National Academy of Sciences* (*PNAS*; Berenhaut et al 2022); our paper, submitted here, provides additional details about the accompanying R package, pald, including several examples as well as contrasts with commonly used techniques. We believe this paper will serve both methodologists who are familiar with the PaLD method and are interested in implementing it in R as well as general R users who are not yet familiar with PaLD, but could integrate it into their current data science workflows. We have included examples from data sets ranging from gene expression data to cognate-based language data and cultural and psychological distance data. Additionally, we contrast the PaLD methods with commonly used clustering techniques, *k*-means and hierarchical clustering.

We believe that our method as well as the implementation could be of interest to the readers of *The R Journal*.

We thank you in advance for your time and effort with this submission. Please address all correspondence to Lucy D'Agostino McGowan at Wake Forest University.

Sincerely,

Lucy D'Agostino McGowan

Lucy D'Agostino McGowan, on behalf of the co-authors