

A notion of depth for curved data

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Following the seminal idea of John W. Tukey, statistical data depth is a function that determines centrality of an arbitrary point w.r.t. a data cloud or a probability measure. During the last decades, data depth rapidly developed to a powerful machinery proving to be useful in various elds of science. Recently, implementing the idea of depth in the functional setting attracted a lot of attention among theoreticians and applicants. We suggest a Tukey-based notion of data depth suitable for data represented as curves, or trajectories, which inherits both Euclidean-geometry and functional properties but overcomes certain limitations of the previous approaches. It can be shown that the Tukey curve depth satisfies the requirements posed on the general depth function, which are meaningful for trajectories. Application of the Tukey curve depth is illustrated in the domains of brain imaging and written digits recognition. Joint work with Pierre Lafaye de Michaux, Myriam Vimond.