

**López-Pintado, Sara; Sun, Ying; Lin, Juan K.; Genton, Marc G.**

**Simplicial band depth for multivariate functional data.** (English) Zbl 1414.62066

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**Summary:** We propose notions of simplicial band depth for multivariate functional data that extend the univariate functional band depth. The proposed simplicial band depths provide simple and natural criteria to measure the centrality of a trajectory within a sample of curves. Based on these depths, a sample of multivariate curves can be ordered from the center outward and order statistics can be defined. Properties of the proposed depths, such as invariance and consistency, can be established. A simulation study shows the robustness of this new definition of depth and the advantages of using a multivariate depth versus the marginal depths for detecting outliers. Real data examples from growth curves and signature data are used to illustrate the performance and usefulness of the proposed depths.

**MSC:**

**62F07** Statistical ranking and selection procedures

**62M10** Time series, auto-correlation, regression, etc. in statistics (GARCH)

Cited in 7 Documents

**Keywords:**

band depth; functional boxplot; functional and image data; modified band depth; multivariate; simplicial

**Software:**

AS 307; fda (R)

**Full Text:** [DOI](#)

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