

1 **FastMUOD Indices: Theory and applications for** 2 **outlier detection in functional data analysis**

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13 **Abstract**

14 We present theoretical definitions and properties of the FastMUOD indices, used for outlier detection
15 in functional data. FastMUOD detects outliers by computing for each curve: amplitude, magnitude
16 and shape indices meant to target the respective types of outliers. We also present sample versions of
17 these indices and prove their convergence. Finally, we propose some ideas for adapting FastMUOD
18 indices to outlier detection in multivariate functional data. We test some of these ideas on various
19 simulated and real datasets including handwritten characters and video datasets.

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