



## Functional clustering of mouse ultrasonic vocalization data

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Mouse ultrasonic vocalizations (USVs) are studied in various fields of science. However, background noise and varied USV patterns in observed signals make complete automatic analysis difficult. We propose a series of methods to cluster mouse USV data automatically. The procedure includes noise reduction, detecting USV calls, transforming USV calls as functions and functional clustering. The proposed methods are shown useful with two data sets taken from laboratory mice.

**Keywords:** breakpoint; B-spline basis function; functional cluster analysis; moving average.