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The BAGIDIS method, a new way for measuring distances between curves with sharp variations

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Abstract.
Expanding a series in an adaptive orthonormal basis, that is made of unbalanced Haar wavelets (Fryzlewicz, 2007; Girardi and Sweldens, 1997), means expressing the series as a sum of terms of decreasing importance: the first terms of the expansion encode major features of the series while subsequent terms describe less significant patterns. The features we consider to be essential here are locally important level changes (peaks) or levels changes affecting a large number of data (discontinuity of the mean level).
This study investigates the possibility to exploit the 'hierarchical' property of the unbalanced Haar wavelets expansion in order to define a dissimilarity measure between curves with sharp variations.

Reference.

Fryzlewicz, P., 2007, Unbalanced Haar technique for nonparametric function estimation, Journal of the American Statistical Association (Theory and Methods), 102, 1318-1327.

Maria Girardi and Wim Sweldens, 1997, A new class of unbalanced Haar wavelets that form an unconditional basis for Lp on general measure spaces, J. Fourier Anal. Appl. 3, 457-474