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Model-free estimation of the roughness exponent of a continuous trajectory

We discuss ways of characterizing the "roughness" of a trajectory by means of its p^{th} variation or its Wiener–Young Φ -variation. This gives rise to an index, which can be interpreted as the Hurst parameter of the trajectory. We analyze several examples among classical fractal functions. We also discuss new estimators for the Hurst parameter, whose consistency can be established without any probabilistic assumptions on the underlying trajectories. Our results are illustrated by means of financial time series.

Based on joint work with Xiyue Han and Zhenyuan Zhang.