A Robbins-Monro algorithm for nonparametric estimation of functional AR process with Markov-switching

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Abstract: We consider nonparametric estimation for functional autoregressive process with Markov switching. First, we study the case where complete data is available; i.e. when we observe the Markov switching regime. Then we estimate the regression function in each regime using a Nadaraya-Watson type estimator. Second, we introduce a nonparametric recursive algorithm in the case of hidden Markov switching regime. Our algorithm restores the missing data by means of a Monte-Carlo step and estimate the regression function via a Robbins-Monro step. Consistency and asymptotic normality of the estimators are proved.