NONPARAMETRIC ESTIMATION FOR I.I.D. GAUSSIAN CONTINUOUS TIME MOVING AVERAGE MODELS

FABIENNE COMTE

Abstract: We consider a Gaussian continuous time moving average model $X(t) = \int_0^t a(t-s)dW(s)$ where W is a standard Brownian motion and $a(.)$ a deterministic function locally square integrable on $\mathbb{R}^+$. Given N *i.i.d.* continuous time observations of $(X_i(t))_{t\in[0,T]}$ on $[0,T]$, for $i = 1,\dots,N$ distributed like $(X(t))_{t\in[0,T]}$, we propose nonparametric projection estimators of a^2 under different sets of assumptions, which authorize or not fractional models. We study the asymptotics in T, N (depending on the setup) ensuring their consistency, provide their nonparametric rates of convergence on functional regularity spaces. Then, we propose a data-driven method corresponding to each setup, for selecting the dimension of the projection space. The findings are illustrated through a simulation study.
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