

APPROXIMATION OF INTEGRAL TYPE FUNCTIONAL OF MARKOV PROCESSES

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Occupation time; Markov process; convergence rates:

For Markov process $(X_t, 0 \leq t \leq T)$ the problem of estimating the integral functional

$$\Gamma_t(f) = \int_0^t f(X_s) ds, 0 \leq t \leq T$$

is considered. Functional Γ_t is not regular when the domain contains non smooth functions. Consequently, the approximation error can't be analysed with classical techniques. In this talk, an innovative approach that allows to control the estimation error based on the Sobolev smoothness s of f is presented. When X is a stationary diffusion, we derive a convergence rate $n^{-\frac{1+s}{2}}$, independent of the dimension of the state space.

Presented work generalizes results obtained in [1] and [2] for Markov processes and in [3], [4] for scalar diffusions.

References

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- [3] Ngo, H.L. and Ogawa, S. (2011) *On the discrete approximation of occupation time of diffusion processes*, Electronic Journal of Statistics 5, 1374-1393.
- [4] Kohatsu-Higa, A., Makhlof, A. and Ngo, H.L. (2014) *Approximations of non-smooth integral type functionals of one dimensional diffusion processes*, Stochastic Processes and their Applications 124, 1881-1909.