

PROXIMAL-LANGEVIN SAMPLERS FOR NONSMOOTH COMPOSITE POSTERIOR: APPLICATION TO THE ESTIMATION OF COVID-19 REPRODUCTION NUMBER

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Providing a level of confidence in the estimation of epidemiological indicators during pandemics is essential to inform decision makers. Monitoring the time evolution of the epidemic intensity despite the limited quality of the data is both crucial and challenging. For the estimation of the Covid-19 reproduction number through credibility intervals, a Bayesian model robust to errors in reported counts were proposed, yielding a non differentiable composite a posteriori log-density which required the design of advanced Proximal Langevin schemes. The first goal of this paper is to customize and compare on a pedagogically designed toy example, four different Hastings-Metropolis

algorithms combining Langevin approaches and proximal operators. Then, the most efficient one is plugged into a Metropolis-within-Gibbs algorithm performing a credibility intervals-based estimation of Covid-19 pandemic indicators, exemplified for several countries worldwide.