



# Forward variable selection for ultra-high dimensional quantile regression models

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## Abstract

We propose forward variable selection procedures with a stopping rule for feature screening in ultra-high-dimensional quantile regression models. For such very large models, penalized methods do not work and some preliminary feature screening is necessary. We demonstrate the desirable theoretical properties of our forward procedures by taking care of uniformity w.r.t. subsets of covariates properly. The necessity of such uniformity is often overlooked in the literature. Our stopping rule suitably incorporates the model size at each stage. We also present the results of simulation studies and a real data application to show their good finite sample performances.

**Keywords** Forward procedure · Check function · Sparsity · Screening consistency · Stopping rule

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