



# Asymptotics for minimisers of convex processes

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By means of two simple convexity arguments we are able to develop a general method for proving consistency and asymptotic normality of estimators that are defined by minimisation of convex criterion functions. This method is then applied to a fair range of different statistical estimation problems, including Cox regression, logistic and Poisson regression, least absolute deviation regression outside model conditions, and pseudo-likelihood estimation for Markov chains.

Our paper has two aims. The first is to exposit the method itself, which in many cases, under reasonable regularity conditions, leads to new proofs that are simpler than the traditional proofs. Our second aim is to exploit the method to its limits for logistic regression and Cox regression, where we seek asymptotic results under as weak regularity conditions as possible. For Cox regression in particular we are able to weaken previously published regularity conditions substantially.

Comments: Unpublished, but much cited, preprint from 1993

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