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Nonparametric estimation of a conditional density

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Abstract In this paper, we estimate a conditional density. In contrast to standard results in the literature in this context we assume that for each observed value of the covariate we observe a sample of the corresponding conditional distribution of size larger than one. A density estimate is defined taking into account the data from all the samples by computing a weighted average using weights depending on the covariates. The error of the density estimate is measured by the L_1-error. Results concerning consistency and rate of convergence of the estimate are presented, and the performance of the estimate for finite sample size is illustrated using simulated data. Furthermore, the estimate is applied to a problem in fatigue analysis.

Keywords Conditional density estimation · L_1-error · Consistency · Rate of convergence

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