

# **Jump or Kink: Super-efficiency in Segmented Linear Regression Break-point Estimation**

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**Abstract:** We consider the problem of segmented linear regression with the focus on estimating of the location of the break-point(s). Let  $n$  be the sample size, we show that the global minimax convergence rate for this problem in terms of the mean absolute error is  $O(n^{-1/3})$ . On the other hand, we demonstrate the construction of a super-efficient estimator that achieves the pointwise convergence rate of either  $O(n^{-1})$  or  $O(n^{-1/2})$  for every fixed parameter values, depending on whether the structural change is a jump or a kink. We discuss the implications of this example and the potential remedy. We also illustrate this phenomenon in the multivariate setting.