

GOODNESS-OF-FIT TESTING FOR MULTINOMIALS AND DENSITIES: SHARP LOCAL MINIMAX RATES

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Abstract: We derive local minimax rates for the goodness-of-fit testing problem in two different settings: the high-dimensional multinomial case and the density case. We consider the local problem, that is, we allow the known distribution p under the null hypothesis to have a general form within a given class. In the density setting, we consider the α -Hölder class of densities on \mathbb{R}^d with any $\alpha > 0$. We derive the local, that is, depending on p minimax rates of testing under the L_t norm on discrete or continuous spaces, with t in $[1,2]$. Local upper and lower bounds (matching not for all p in the class) were previously obtained by Valiant and Valiant (2013) in the multinomial setting with $t = 1$, and by Balakrishnan and Wasserman (2018) in the density setting with $t = 1$, $\alpha = 1$. Our approach is somewhat different and leads to the upper and lower bounds that match for all p in the class. This is a joint work with Alexandra Carpentier.