NONPARAMETRIC COMPARISON OF TWO REGRESSION FUNCTIONS

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ABSTRACT

In this work we provide a new methodology for comparing regression functions \( m_1 \) and \( m_2 \) in two samples. Since apart from smoothness no other (parametric) assumptions are required, our approach is based on a comparison of nonparametric estimators \( \hat{m}_1 \) and \( \hat{m}_2 \) of \( m_1 \) and \( m_2 \), respectively. Our test statistics \( T \) are weighted averages of differences between two kernel estimators, with a given weight function \( W \). To obtain the distribution of the test statistics, we provide some asymptotic theory. As our main results we obtain the limit distribution of \( T \) (properly standardized) under the null hypothesis \( H_0 : m_1 = m_2 \) and under local and global alternatives. We also show that our tests are consistent when the alternative is fixed. In a simulation study we find out that our tests achieve the nominal level and have excellent power already for small to moderate sample sizes. As to proofs we heavily make use of results from empirical process theory, U-statistics and nonparametric curve estimation.