CrossMark

Testing for symmetry and conditional symmetry using asymmetric kernels

**Marcelo Fernandes · Eduardo F. Mendes ·
Olivier Scaillet**

Abstract We derive nonparametric tests of symmetry using asymmetric kernels with either vanishing or fixed bandwidths. The idea is to split the sample around the symmetry point and then test whether the distributions to the right and to the left are the same. We show how to extend the approach to examine conditional symmetry by deriving conditions under which our tests are applicable to residuals from semiparametric models with a (sufficiently smooth) nonparametric link function. The latter setting is general enough to entertain as a particular case a unknown symmetry point, which we duely estimate by the sample median. The conditions we derive ensure that the resulting estimation error is asymptotically negligible. Simulations show that the asymptotic tests perform well even in very small samples, entailing better size and power properties than some of the existing symmetry tests.