

Modality Analysis with Higher-Order Density Estimation

Michael C. Minnotte

University of North Dakota

E-Mail: michael.minnotte@und.edu

Abstract: A number of approaches to mode detection and testing involve the intermediate use of kernel density estimation. These include Silverman's (1981) critical bandwidth test, Minnotte and Scott's (1993) mode tree, and Chaudhuri and Marron's (1999) SiZer plots. We investigate the use of higher-order (reduced bias) variants of kernel density estimates in mode testing and visualization. Fourth-order variable bandwidth density estimates appear to be especially favorable for bump hunting, while the use of fourth-order kernels for the purpose should be strongly discouraged.