

This thesis explores the concepts of location and scatter halfspace depth. Location halfspace depth is a well-established tool in nonparametric statistics, while scatter halfspace depth represents a newer concept that is currently undergoing active research. The primary goal of this work is to present the fundamental properties of halfspace depth for both location and scatter, with a special emphasis on the robustness of the corresponding medians. A significant portion of the thesis is dedicated to examining the minimax optimality of the location and scatter halfspace median. It provides a detailed framework concerning the rates of convergence and minimax optimal estimators. By employing this framework, the thesis demonstrates that both the location halfspace median and the scatter halfspace median achieve minimax optimality within Huber's contamination model. This finding underscores both the robustness and the rate optimality of these estimators.