

This thesis is focused on classification methods and their robust alternatives. First, we recall the standard classification rules of linear and quadratic discrimination analysis. We also show some methods for estimating their probability of misclassification. Next we describe some existing robust multivariate estimators, their properties and computational algorithms. These estimators are consequently used to construct robust classification rules. Then, we describe the principal component analysis as a technique for dimension reduction. Again, we study methods for its robustification. Finally, we illustrate the usage of robust classification on both numerical simulations and real data. We also investigate the influence of the principal component analysis on classification results.