In this thesis, we present selected methods of regression and classification analysis in terms of robust optimization which aim to compensate for data imprecisions and measurement errors. In the first part, ordinary least squares method and its generalizations derived within the context of robust optimization - ridge regression and Lasso method are introduced. The connection between robust least squares and stated generalizations is also shown. Theoretical results are accompanied with simulation study investigating from a different perspective the robustness of stated methods. In the second part, we define a modern classification method - Support Vector Machines (SVM). Using the obtained knowledge, we formulate a robust SVM method, which can be applied in robust classification. The final part is devoted to the biometric identification of a style of typing and an individual based on keystroke dynamics using the formulated theory.