

**Title:** Statistical image analysis in quality control

**Author:** David Legát

**Department:** Department of probability and mathematical statistics

**Supervisor:** Prof. RNDr. Jaromír Antoch, CSc.

**Abstract:** Currently, necessity to handle unstructured data rises significantly. One important area of unstructured data manipulation is signal processing such as audio and video, for which there exist many procedures. This work deals with the statistical approach to image processing, in which the image is interpreted as a representative of a random field. It describes two problems: removing noise from an image which facilitates better interpretation of the image, and image classification, in which we try to identify and recognize objects displayed. Part of the work aimed at eliminating of noise deals primarily with the use of MCMC simulation methods. These procedures can be tested in software that is included. Part of the work dealing with the classification of the image describes various modifications of classification trees methods. An example of image processing, which is the identification of defects in woven fabrics, is presented at the end.