

Application of computational methods in classification of glass stones

Bc. Matěj Lébl

Abstrakt: The goal of this thesis is to employ mathematical image processing methods in automatic quality control of glass jewellery stones. The main mathematical subject is a matrix of specific attributes representing digital image of the studied products. First, the thesis summarizes mathematical definition of digital image and some standard image processing methods. Then, a complete solution to the considered problem is presented. The solution consists of stone localization within the image followed by analysis of the localized area. Two localization approaches are presented. The first is based on the matrix convolution and optimized through the Fourier transform. The second uses mathematical methods of thresholding and median filtering, and data projection into one dimension. The localized area is analyzed based on statistical distribution of the stone brightness. All methods are implemented in the MATLAB environment.