

ALGORITHM FOR AUTOMATIC OBJECTIVE DETERMINATION OF VISUAL CHARACTERISTICS OF BEER

Angel Danev^{1*}, Radoslava Gabrova¹, Vladimira Ganchovska¹

¹Department of Computer Systems and Technologies, University of Food Technologies,
Maritza Boulevard 2, 4000 Plovdiv, Bulgaria

*e-mail: angel_danev_bg@abv.bg

Abstract

The changes in the height of the beer foam and the rate of decline are important organoleptic indicators in determining the quality of beer. The aim of this report is to present an algorithm for automatic and objective determination of visual characteristics of beer.

To conduct the experiments several components are used: a specially designed experimental setting to unify the conditions of the experiments such as: uniform lightening source, noise lighting from the environment, reflections and other; a standard glass container for pouring beer samples and a digital camera for capturing a videos from the moment of pouring the beer to the moment of visual drop of the beer foam. A frames (digital images) are cut from the original videos at a regular intervals. Using a computer vision programs - NI Vision Builder and NI Vision Assistant and the obtained frames, an algorithm was developed for objective detection of visual characteristics of beer.

Several, well known automatic algorithms for segmentation have been tested and two of them which give an optimal result are selected - one for determining the height of the liquid and a different one for determining the height of the foam. Various morphological operations are applied to the binary images. In order to increase the accuracy of determining the height of the beer foam, a subprogram is developed, including mathematical and logical operations. The developed algorithm and program are tested with one brand of domestic beer bought from the marketplace. The results obtained after the application of the developed algorithm and program are informative enough for the objective determination of the changes in the height of the liquid phase and the beer foam.

Based on the obtained results, further analyzes of the stability of the beer foam can be performed in order to evaluate the quality of beer.

Key words: Digital image processing, Computer vision, NI Vision Builder, NI Vision Assistant, Beer quality, Beer foam.