

Application of ImageJ in Printing Technology - Use of Macros for Automation of Analysis Procedures

Abstract:

The paper deals with the use of ImageJ as the image analysis tool for the printing industry. Due to the fact that ImageJ is free and open source, it is available to wide range of users and developers. The built-in functions can be adapted for specific use and new procedures can be developed and automated through macros and plugins. Image analysis is frequently used in the printing and papermaking industry, mainly for the inspection of printing substrates' characteristics during and after the production and converting stages. In the printing processes, image analysis is used for evaluation of the interactions between inks and substrates, which affect the substrate printability and in the end contribute to the print quality. Case studies described here will explain the procedures dealing with the use of ImageJ for the following purposes:

- Analysis of images of Ink-jet ink and paper interaction captured by CLSM (Confocal Laser Scanning Microscope), dealing with stacks of optical sections taken at successive focal planes and their reconstruction to a 3D view of a printed sample.
- Analysis of SEM (Scanning Electron Microscope) images of ink on paper, dealing with the calculations of coverage of surface and characterization of the dot geometry.
- Characterization of non-uniformity of the prints (mottle), by calculating the mottle index from the images obtained from the flat-bed scanner.
- Analysis of the dot formation process of the Ink-jet ink on various paper substrates from the t-series slices captured by CCD camera.

The macro routines were developed for each use in order to automate the procedures and thus facilitate the use of ImageJ as the tool for described purposes.

Keywords:

Printing industry, CLSM images, SEM images, Ink-jet ink, Printing substrates, Mottle

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Short Biography

Maja Stanic was born on the 18th of November 1981 in Zagreb, Croatia. She is currently a full-time PhD student at the postgraduate doctorate study Graphic Engineering, at the Faculty of Graphic Arts,


University of Zagreb. She has received her graduation diploma in Graphic Technology from the same university, in 2006.

Her work and research interests are:

- novel printing techniques, such as 3D ink-jet printing
- developments in digital printing techniques, especially ink-jet printing
- ink/substrate interactions
- print quality assessment
- use of image analysis techniques in paper and printing technology.

Her thesis work aims to explain various properties of 3D ink-jet prints in relation to material options and printing preferences, in which she, among various other techniques, uses the image analysis and processing as well.

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