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On-line measurement tools

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e*Content*plus

This project is funded under the *e*Content*plus* programme[1],
a multiannual Community programme to make digital content in Europe more accessible, usable and exploitable.

[1] OJ L 79, 24.3.2005, p. 1.

Scope of work in this deliverable

The scope of work in this deliverable is to offer measurement tools to a user of the Bernstein portal. The height and/or width of a watermark are important parameters helping narrowing the search for a specific item. The density of laid lines and the distance between the chain lines are further parameters significant for the search and identification as well as for wider studies of paper production technologies and their local characteristics.

The Bernstein project offers on the *Expertise* web-page two program packages (AD751, Rembrandt) for performing measurements.

Description of individual products

AD751

AD751 is a measurement tool for calculation of laid lines densities from paper structure reproductions. It is downloadable and works standalone.
The analysis of the density of papermaking mould screen imprints is instrumental in dating, localizing and classifying papers. By dividing digital reproductions of paper structures into spots, the AD751 software offers an accurate measurement tool involving wide-spread statistical possibilities, both quantitative and qualitative. AD751 is based on the Fourier transform.

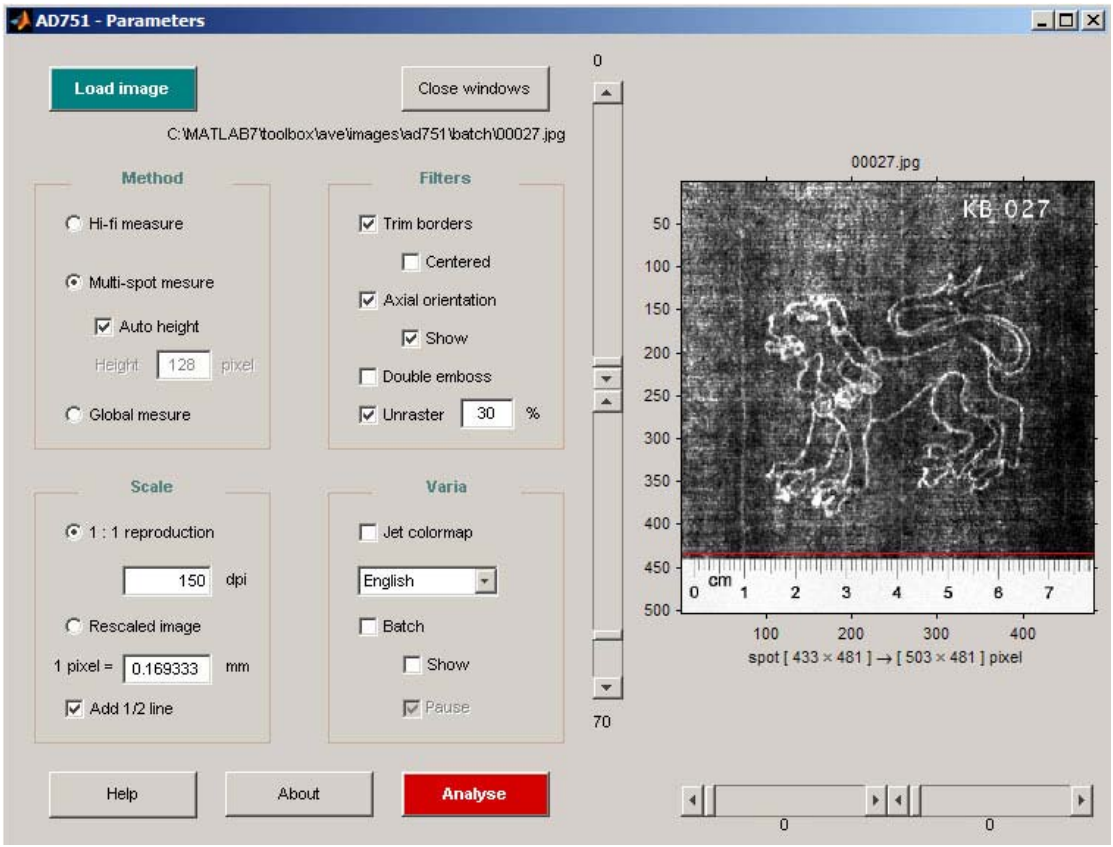

Figure 1: The settings window

AD751 is an open-source software, freely downloadable from the Bernstein portal. It is written in Matlab, a standard package for scientific computational research and available both as a Matlab application and as an executable Microsoft Windows version. The analysis progress is displayed on the screen and the resulting data-individual spot density, global mean, range and standard deviation-saved. The images can be processed one by one or in batches. The interface is made available in four languages (English, French, German, Italian).

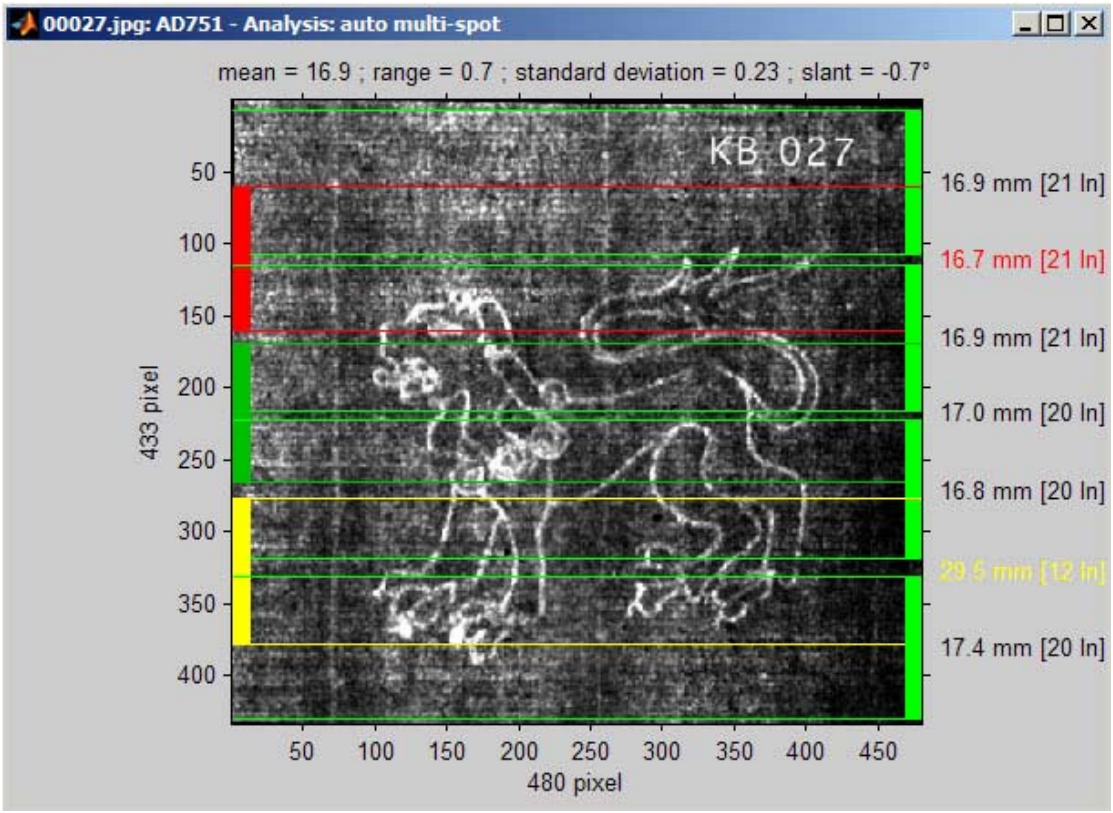

Figure 2: Measuring the spot densities and computing global statistics

Rembrandt

Rembrandt is a software package for discovering identical pieces of paper based on laid and chain lines data developed by DUT (Delft University of Technology). The details are described in the paper Paper retrieval based on specific paper features: Chain and laid lines. An example can be found at http://rembrandt.ewi.tudelft.nl/index.php. By means of feature detection methods the specific paper features are detected, which are further used for training a similarity measure. This measure is trained in a way to optimize the retrieval performance. The analysis of paper features showed that the chain line distance vector was the most discriminating feature, and that a good retrieval is obtained by combining all paper features.

Dissemination kit (PSK – Digital paper studies kit)

The dissemination kit contains along with the watermark database functions a module for measurements. This module allows to measure metric parameters of watermarks: the height and width of watermarks and the distance of chain lines. The digital paper study kit is described in detail in Deliverable no. 29 (D6.5 – Digital paper studies kit).

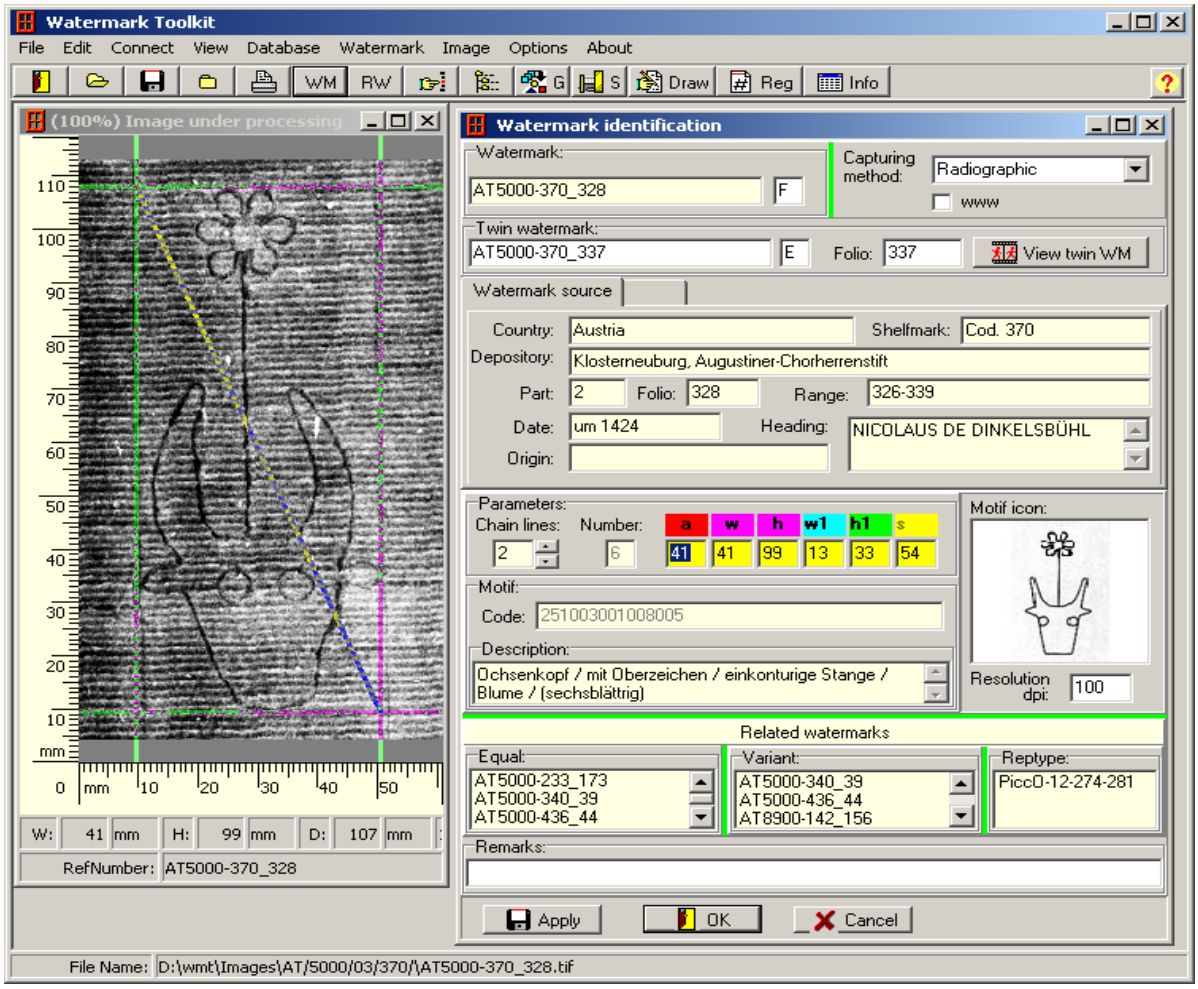

Figure 3: Screen shot of the measurement module of the digital paper study kit.