

Moshe Rosenfeld, Quantifying Paper-Ink-Type Interaction
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Printed paper is key evidence to study the early history of printing in the fifteenth century. No written description of the new craft was left by the early pioneers. On the contrary they sought to keep secrecy. Printed paper of early books were examined by generations of historians leading to fierce debates regarding printing dates and printing methods.

Traditional print was created by the interaction of paper, ink, and type, each of which is made in a very different material by its own manufacturing process and subsequent wear. No wonder that great variability in the result can be expected. The variability carries information that can be attributed to either of those three components. The assumption is that the elucidation of this variability can shed light on some of the questions debated among historians.

The authors propose to add on existing approaches taking advantage of the progress in digitization and image processing; techniques that are now ubiquitous. The goal is to provide quantitative metrics extracted from printed texts in order to reveal systematic patterns of variability or, to the contrary, singular values of that variability.

Historians started with naked-eye inspection of printed works. Facsimile reproductions extended the options to examine works. Different optical tools were later used. Lastly computers were introduced. Here the proposal is to extract characters from very high-resolution scans of printed texts in a statistically representative quantity, then to aggregate the presumably identical letters in what the authors call "a master signature". The next step is to quantify for each character the departure from the "master signature".

The authors demonstrate their methods on early printed Hebrew works, since the idea of those methods came as a tool to evaluate such works. However, the methods are likewise applicable to gothic Latin characters.

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