



## Image data processing for printing

### Invention

**This invention provides a set of new rasterization techniques incorporating the specific dotgain of a printer, enabling both very high resolution and printing of multiple channels without moiré pattern. Sharp images with a reliable color reproduction can be achieved using an integrative measurement of the behavior of all channels resulting in a raster optimized for a specific device.**

### Background

Today's printing devices commonly rely on amplitude modulated (AM) or frequency modulated (FM) halftoning. Ink spread as well as the optical path of light through the ink and substrate introduces a deviation from an ideal dot in manifold and mostly unknown ways. One commonly refers to such effects as "dotgain". When printing with FM, dotgain is much harder to control than with AM, making it hard to integrate FM into a standard workflow like the ICC-CMS. Therefore, FM is not used widely in high volume printing.

### Advantages

FM is well known to result in higher resolution images compared to typical AM techniques. By using integrative measurement of predefined patterns and by controlling the amount of overprints in maximal resolution, the printing process can be controlled and increasingly resembles additive printing. In this invention, the dotgain is directly incorporated into the algorithm instead of applying preliminary color-corrections. Therefore, possible loss of contrast and detail caused by the color corrections is avoided even when using high resolutions.

## Applications

Several FM algorithms are already used for testing by various printing companies. This invention is especially designed to be integrated to high volume printing but is applicable in office printing as well. The use of overprint-control introduces a trend to additive printing. This algorithm is design both for high- and low-register-accuracy devices.

## Ownership

Empa, Swiss Federal Laboratories for Materials Testing and Research, Überlandstrasse 129, CH-8600 Dübendorf

## References

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## Keywords

FM Halftoning, Error Diffusion, Dotgain, Additive Printing

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