

ABSTRACTS

Volume 16, Number 1

A Comparison of Class Characteristics Among Several Crosscut Shredders

Matthew McDonald, BS and Larry A. Olson, MFS

Although a handful of papers have been written on the re-assembly of shredded documents, little is known about how shredders of different makes and models operate. The purpose of this project was to distinguish crosscut shredders of different makes and models by determining the manner in which they shred. A total of seven shredders were evaluated by means of their paper shred and machine characteristics. Several of these characteristics include mean width and length of the shred, physical appearance of the shreds, width of the shredder throat and the type of cutting mechanism within the machine. Three of the seven shredders were of different makes, while two pairs of machines were of the same make and model. The two primary objectives of this research were: first, to analyze the output of the seven shredders; and second, to determine and compare the class characteristics of each individual shredder. It was also expected that possible indications of individual characteristics might be detected between the shredders of the same make and model.

An “Ideal” Methodology for Manually Assembling Crosscut Shredded Documents

Larry A. Olson, MFS

This paper outlines a procedure the author developed while working an “ideal” case—the reassembly of a small bag of crosscut shredded documents. The shredded pieces, or “shred” were made up of several colors of paper, with a variety of handwritten or printed entries.

The author discovered that, by making some rudimentary measurements of the shredded particles, assembling a small portion of a document, and observing how the crosscuts occurred, it was possible to predict and visualize the pattern into which the document was shredded. With this pattern, and other techniques used to sort and arrange the shredded pieces, the manual reassembly of the document was successfully completed.

Ink Dating—Comparative Examination of Inks on Documents using Optical and Chemical Methods

Valery N. Aginsky, PhD

Comparison of inks on the same or multiple documents is one of the ink dating approaches that determines and compares the physical and optical characteristics (including ink line morphology defects) and chemical composition of writing inks on documents. In this work, writing samples produced by 400 ballpoint pens (200 new and 200 used pens) were examined under the microscope, and the relative frequency of occurrence of various morphology defects, including certain reproducible ink line morphology defects that can be used for the purposes of relative ink dating, was determined. Also, the paper outlines typical case situations in which a comparative examination of inks on documents using optical and chemical methods is used for dating purposes.

Development of a Supplemental Technique to Increase Visualization of Handwriting Indentations in Crumpled Documents with the Use of an Electrostatic Detection Device (EDD)

Kate Savoie, B.S.

Forensic document examiners (FDEs) receive questioned documents in all sorts of conditions: chemically processed, folded, crumpled, wet, frozen, charred, wadded, or a combination thereof. Application of an Electrostatic Detection Device (EDD) is one of the key examinations performed on original questioned documents. These examinations have elicited superb information in the form of latent handwriting indentations as well as pattern impressions that may indicate a printing process, which otherwise might have remained unseen. Crumpled or wadded documents have proven a problem in the area of EDD examinations as the toner particles may adhere to the uneven and prominent creases and folds as opposed to the more subtle and delicate latent handwriting indentations or printing process impressions. This research attempts to develop a supplemental EDD technique in which increased relative humidity (RH), pressure by use of a weight, and/or a stretching technique may be applied to a crumpled piece of paper containing latent handwriting indentations after a traditional EDD exam has already been applied that did not yield fruitful results. These secondary techniques have proven in this research to allow for increased visualization of latent handwriting indentations.

Imaging Methods and Quantitative Measurements for the Characterization of Digitally Printed Materials

Daniel Burge, Nino Gordeladze, Kristin Smith, Jordan Briscoe, Ryan Boatright and James Reilly

Over the last five years, researchers at the Image Permanence Institute at the Rochester Institute of Technology have been developing an imaging strategy and a set of quantitative measurements that can be used to characterize modern digital print materials (both images and documents). While the goal of the project has ultimately been to enable personnel in cultural heritage institutions to identify their collection materials, the approaches should also be helpful to the field of forensic document examination. The imaging methods include varying the angle of lighting as well as the level of magnification. Structures such as surface gloss and texture as well as dot morphology and pattern can be assessed and compared to known print types. Additional, unique traits such as colorant bronzing, differential gloss, anti-block layers, etc. can also be used to narrow down the identification of particular print examples. This paper will describe the main approaches used for both imaging and quantitative measurement of print samples along with descriptions of where support tools can be found online.