



COMPUTER SERVICE PROFESSIONALS, INC.

[ITEM CAPTURE AND IMAGE PROCESSING]

AUTOMATED SIGNATURE VERIFICATION



HIGHLIGHTS

PRODUCT BENEFITS

- Protects you from fraud associated with forged signatures
- Process is fully automated and surpasses visual inspection methods
- Easily integrates into existing systems

TECHNICAL DATA

Input Specifications:

- Image Resolution 200 - 300 dpi
- Acceptable Formats: Black-and-white TIFF , Bitmap (BMP) and JPEG; or grayscale images (TIFF, BMP and JPEG) with 8 bits per pixel.

Output/Results:

- Confidence value of the best match
- Number of signatures found on a document presented for verification or on a reference document
- Preprocessed (cleaned from noise) signature snippet from the document presented for verification or the signature reference document
- Coordinates of rectangle containing signature found on the document
- Reference signature considered 'best match' for a specified signature presented for verification

With advances in technology, check fraud has become a widespread crime. Plain and simple, it's easier for criminals to forge signatures and create counterfeit checks. This situation requires an increased level of alertness. With advanced fraud tools available through CSPI, you can protect your bank from future financial losses.

Automated Signature Verification

Automated Signature Verification is a breakthrough in authentication software technology. Our system detects signature presence; verifies signatures on checks, IRDs and other documents; and reveals all types of fraud. This includes random forgeries produced without knowledge of the original signature shape, and skilled forgeries generated by people who imitate or trace the original signature.

This solution enhances the performance of the verification process and produces tangible and intangible benefits for your bank:

- Increased number of signatures can be verified
- Significant labor savings with automated process
- Increased levels of security
- Ease of overall implementation
- Reduced losses associated with signature fraud

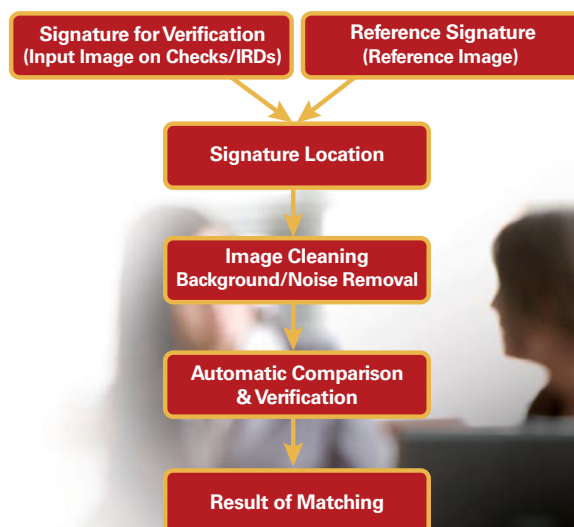
How Does It Work?

Our automated system compares an image of a signature presented for verification against a reference signature image – a genuine signature previously collected from the signer and stored electronically. The system then makes a conclusion about the authenticity of the input signature (see Figure 1). Multiple reference signatures can be used for verification, including signature snippets cut from any document, check image or IRD.

Using multiple reference points allows the software to detect distinctive, yet stable characteristics in a signature. These stable traits are then focused on during the verification process. Simultaneously, the system ignores random distortions and variations inherent to genuine signatures. If both the authentic signature and suspect signature are presented in the form of signature snippets, the comparison process can begin immediately.

The system also performs 'image cleaning' by locating one or two signatures on a check and removing lines, prints, pictures, noise and other intrusions around the signature before the verification process begins. This ensures the most accurate results are achieved.

Figure 1. Main Steps in the Verification Process



"With CSPI's Automated Signature Verification software, we are better protected, with less exposure to check fraud and financial loss."



Automatic Verification Process

Automatic verification is completed using a powerful combination of seven different verifiers. These verifiers employ multiple methods and principles to confirm authenticity, including a human-like holistic approach to signature interpretation, feature extraction and comparisons using several neural network-based learning and interpretation agents, fuzzy logic and other advanced techniques. This process allows for the most comprehensive and intelligent analysis of signature characteristics, taking into consideration random variations that occur.

Examples of Verification Analysis

Geometrical Analysis

Geometrical analysis of the suspect and reference signatures complements the holistic approach and makes verification more efficient. In this method, similar nodes (distinctive elements) of a signature are found in the suspect and reference signatures (see Figure 2). Triads of these nodes are used to build triangles with apexes located in the selected nodes. The similarity of the triangles, belonging to different signatures, is analyzed and used to make a conclusion about authenticity.

Analytical Analysis

In addition to the verification methods that look at the signature as a whole, analytical methods look at segments of the signature. This method uses algorithms to look at fragments of the reference and suspect signatures (see Figure 3). Because this method uses fundamentally different principles than the holistic approach, it is very efficient in cases where the holistic approach cannot ensure the required reliability level of a result.

Figure 2. Geometrical Interpretation of Signatures

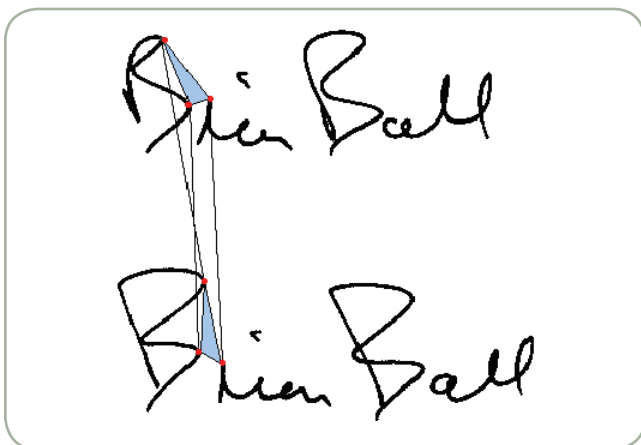
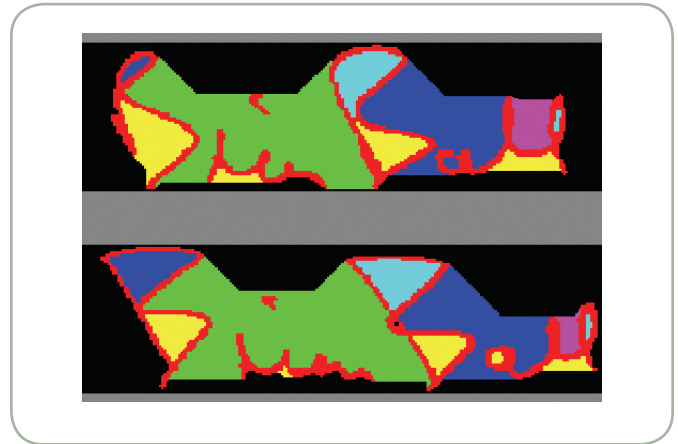


Figure 3. Comparison of Signature Fragments



Verification Results

After the verification process, a confidence value is issued, indicating how confident the software is about the match between the signature presented for verification and the authentic reference signature. A high confidence value indicates a high probability that the signature presented for verification was written by the same person as the reference signature.

A certain confidence value is selected as a threshold and serves as a basis for making a decision about authenticity. Signatures with a confidence value equal or higher than the chosen threshold are considered to be genuine. Signatures with confidence values lower than the threshold are considered to be suspect and flagged for additional human verification.

The business objectives for signature verification can vary based on your intended application. For example, in some organizations the primary goal is to have virtually zero "false negatives" (genuine signatures that are erroneously considered to be fraudulent). Your institution may employ this objective to ensure that valid checks are not erroneously turned down.

No matter what your objectives are, Automated Signature Verification could potentially save your bank millions of dollars by detecting fraudulent signatures. Call us and we'll help protect you immediately.

Request Additional Information

To learn more about our automated signature verification software, or other powerful modules available for your CSPI image POD system, call us at 800.933.4873 or visit our web site at www.cspiinc.com.