

Image Technologies to Detect Fraud

Dick Clausen – Bank of America

Jeff Bottari – SOFTPRO North America

Jim Mason – Computer Sciences Corporation

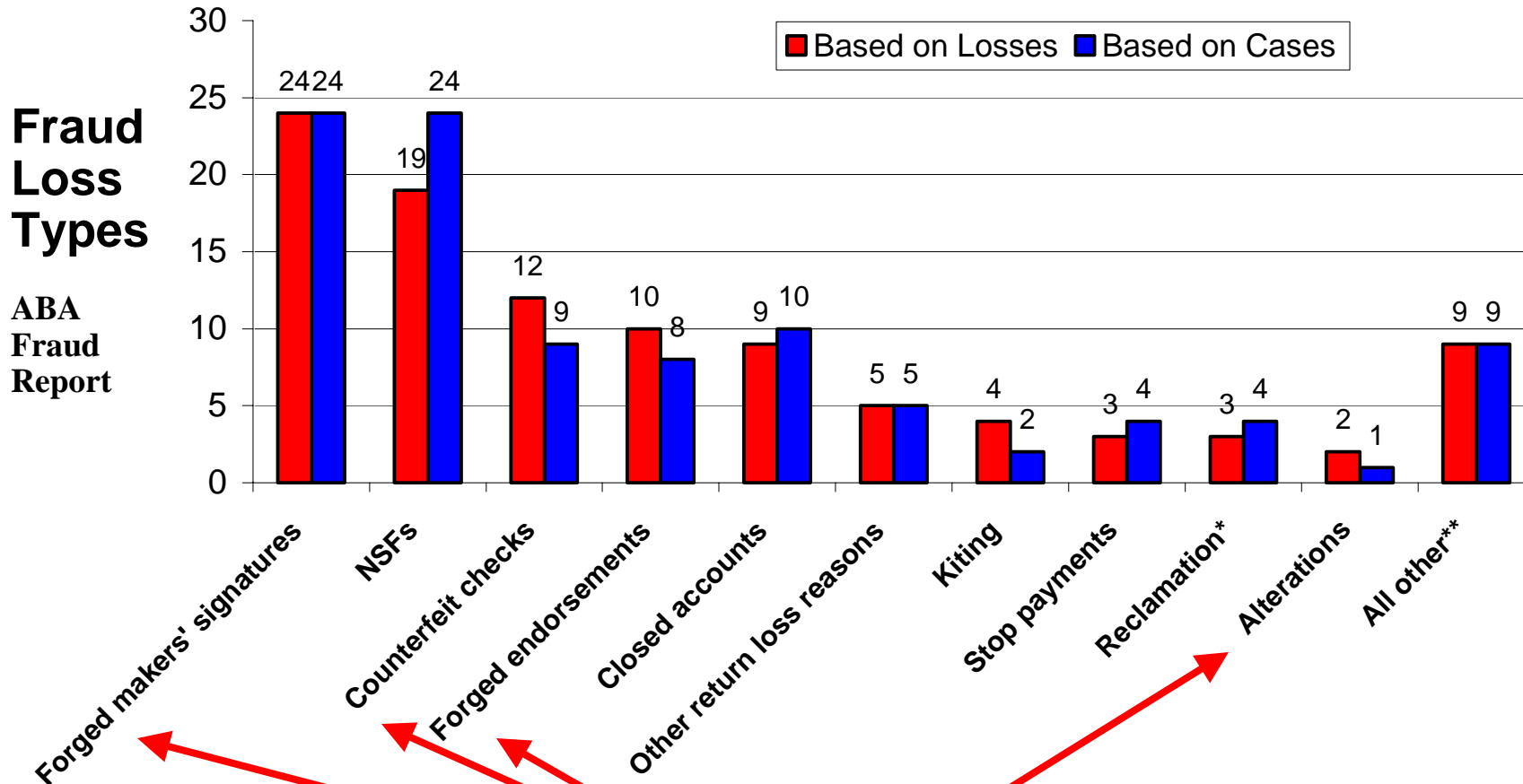
- **Fraud Trends**
- **Image Implications for Fraud Detection**
- **Image-based Fraud Detection Technologies**
 - **Automated Signature Verification**
 - **Comprehensive Image Analysis**
- **Relationship to Other Initiatives**

- **ABA Deposit Account Fraud Study 2002**
 - Fraud attempts doubled in 2001 to \$4 billion
 - Check Fraud is still growing (+3%); downward trend (-20%) for large institutions but upward more quickly for smaller institutions (+200%)
 - More institutions are reporting fraud losses
 - More loss cases (+35%), but at a lower average dollar loss per case (-23%)
- **Identity theft rising**
 - Multiple sources report that identity theft is one of the fastest growing crimes
- **Increasing fraud perpetrator sophistication**
 - Organized crime involvement
 - Multi-channel attacks on consumer accounts (check, debit card, ACH, ATM, pre-authorized drafts, etc.)
 - Exploiting knowledge of bank detection methods including more small dollar attempts

- **Check 21 legislation expected to be signed soon**
 - Joint Conference Committee compromise bill (H.R. 1474) passed by the House on October 8, 2003
 - Act takes effect 12 months from date of enactment
- **Benefits likely to drive rapid adoption**
 - Annual industry benefit estimated to be in \$1B - \$2B range
 - Most banks already have image technology installed
- **Work on standards and infrastructure is proceeding quickly**
 - Image exchange standards and formats
 - Higher resolution images are best for automated image analysis
 - Quality issues and responsibilities
 - Alternative image exchange networks

- **The Bad News**
 - Current paper-based methods of fraud detection must be replaced
 - Clues from paper such as feel, color and smell will be lost
- **The Good News**
 - As digital artifacts, check images enable new methods of fraud detection
 - Automated image-based detection methods
 - Remove the limit on the volume of checks that can be analyzed
 - Provide the foundation for integrated fraud detection operations
 - Image-based fraud detection operations open up new opportunities
 - Industry-wide loss reduction methods
 - More productive integration with other bank operations

Fraud Loss Category Impact



~ 55% of Losses

Image-based Fraud Detection Impact

Automated Signature Verification

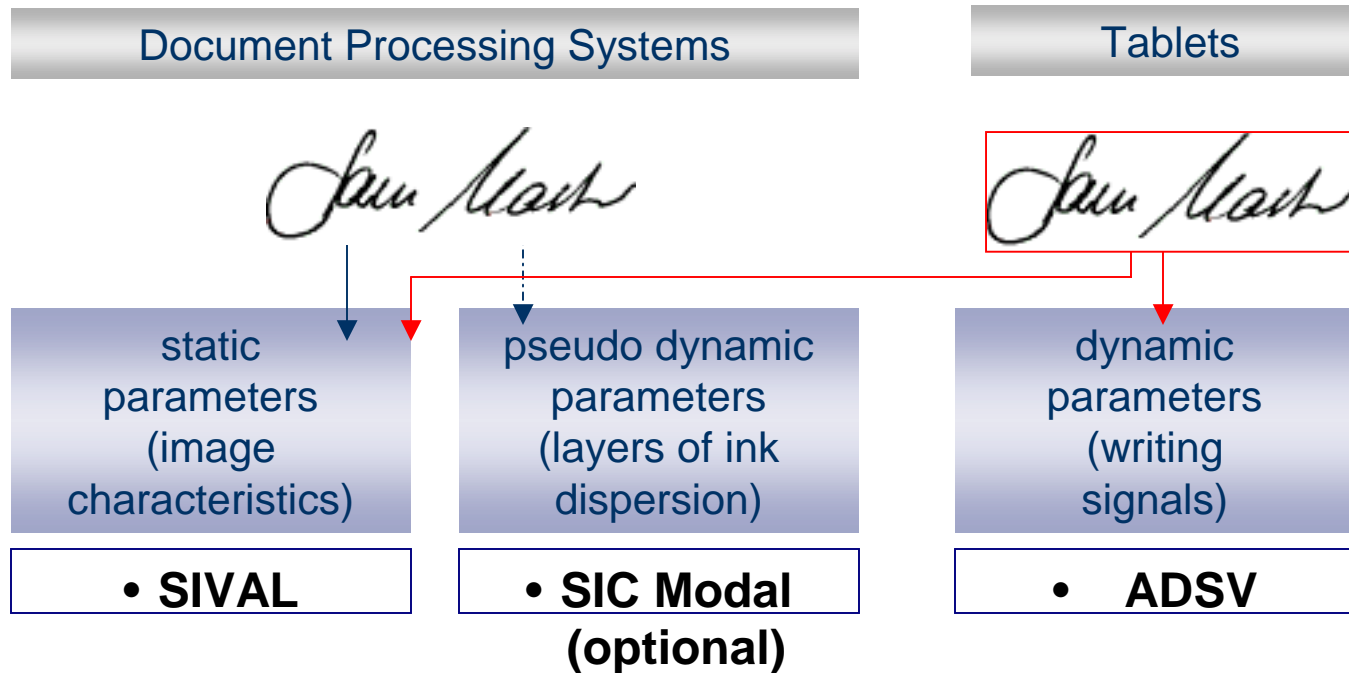


SignPlus Product Suite

- **Enterprise-Wide Reference Signature Database**
 - Optional ability to store imaged signature cards, documents, photos, etc. for Patriot Act Compliance
- **Automatic Signature Verification**
 - Artificial Intelligence Utilizing Neural Network Technology
 - Unlimited Scalability
- **Automatic Signer Rule Verification**
- **Integrated Dynamic (Biometric) Verification**
- **Integrated Electronic Document with Static and Dynamic Signature Capture**
- **Automated Account Opening Process – Electronic Capture of Signatures in Branches**



3 Verification Engines



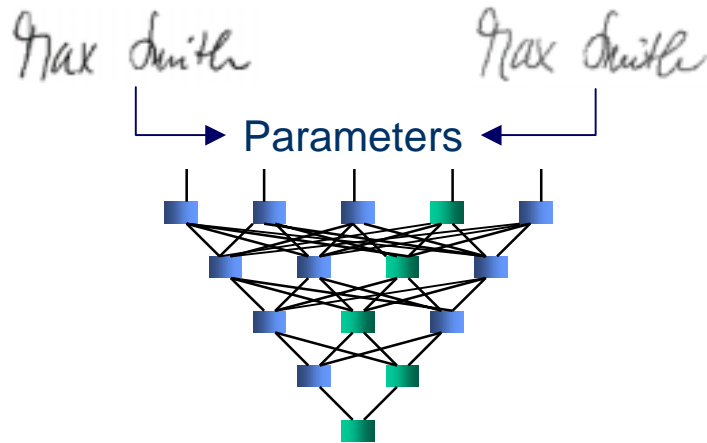
- A neural network decides - similar to the human brain - as it was trained in separate training processes with tens of thousands of signatures.
- Thanks to Fuzzy Logic it also reflects the variability of the various signature characteristics.



Verification Engines - Profile

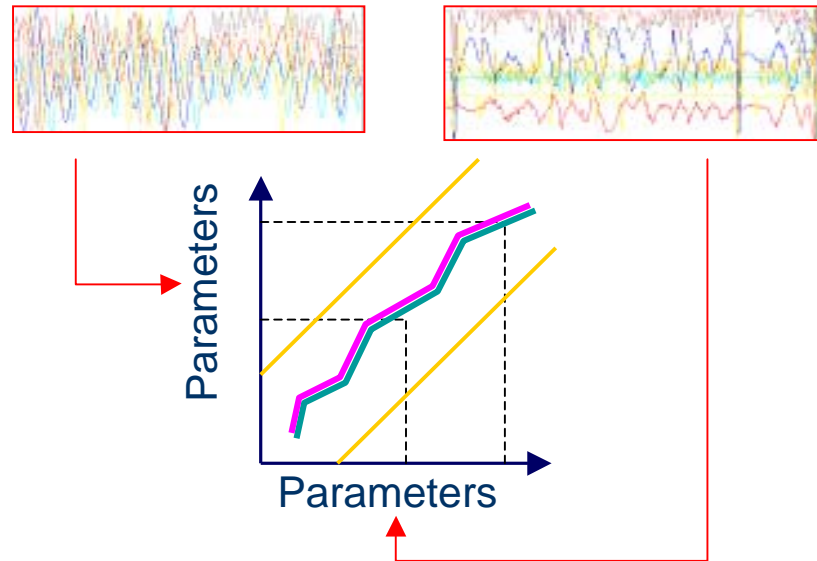
for static attributes

- SIVAL
- Neural network verifying up to 50 primary and 600 secondary parameters



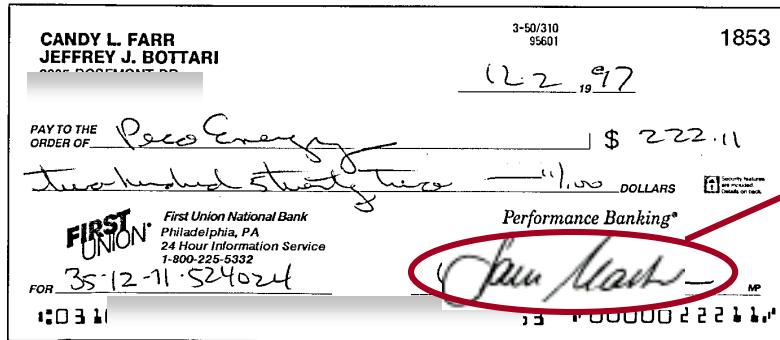
for dynamic attributes

- ADSV
- Dynamic programming algorithm optimized for on-line signatures





Signature Characteristics (Examples)



- upstrokes, crossings etc.



- line vectors



- compactness vectors



- lower enclosed area



- upper enclosed area

Comprehensive Check Image Analysis

Account Profile Concept



Check Layout/Stock

Date

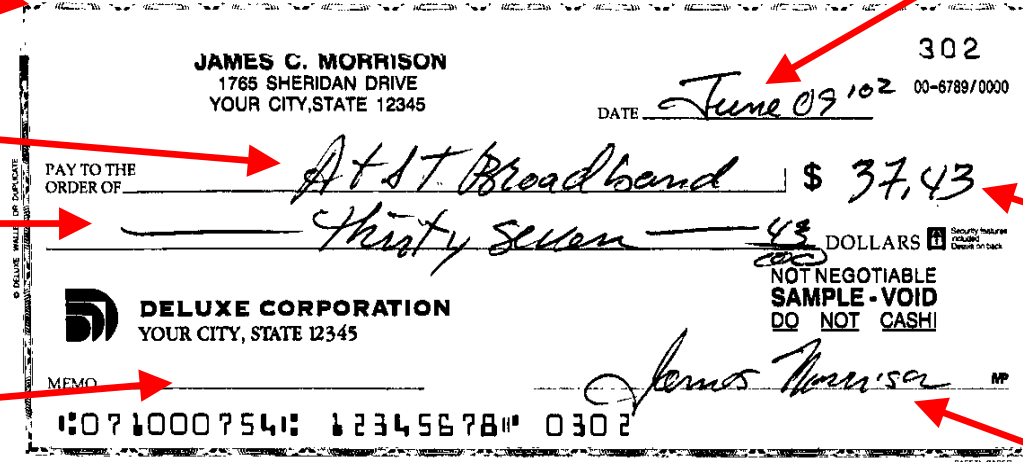
Payee

Legal amount

Courtesy amount

Memo

Signature



- A check writer profile including the characteristics for each of those fields can be used to validate each new check
 - Stock Validation
 - Global Properties
 - Payee Recognition

Automated Check Stock Mask Creation



JAMES C. MORRISON
1765 SHERIDAN DRIVE
YOUR CITY, STATE 12345

00-6789/0000

JAMES C. MORRISON
1765 SHERIDAN DRIVE
YOUR CITY, STATE 12345

DATE June 09 2002 00-6789/0000

PAY TO THE ORDER OF AT&T Broadband \$ 37.43

Thirty seven and 43/100 DOLLARS

DELUXE CORPORATION
YOUR CITY, STATE 12345

MEMO _____

James Morrison

1:07 10007541 12345678 0301

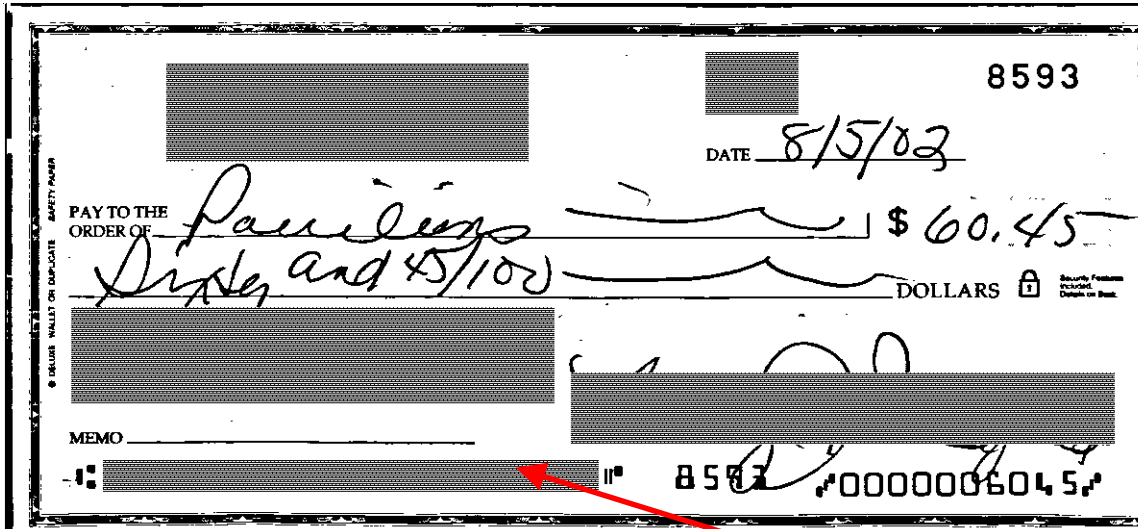
DELUXE CORPORATION DOLLARS

Text
|
Graphic
|
Image

Personal Check Example

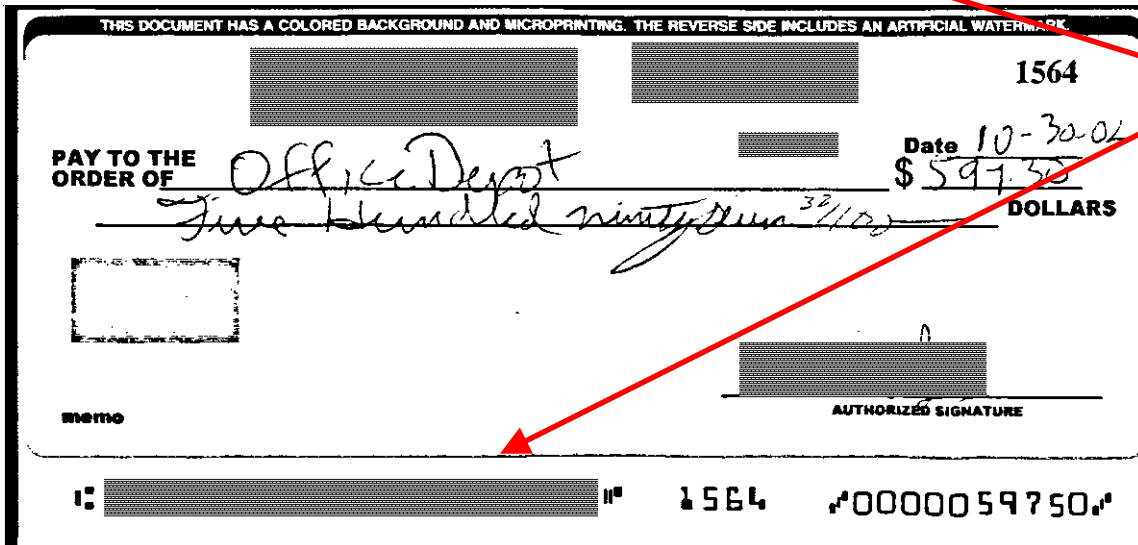


Normal check for account



Stock Validation score = 0

Fraudulent check



Only thing that matches is the account number

Business Check Example



Normal check for account

A normal business check for account. The check is from a company with a logo featuring a hand holding glasses. The check number is 117570, dated 06/30/02. The amount is \$87.63. The payee is redacted. The signature is also redacted. The MICR line at the bottom is ⑈ 0000008763 ⑈.

Fraudulent check

A fraudulent business check. The check has a black header with the text: "THIS DOCUMENT HAS A COLORED BACKGROUND AND MICROPRINTING. THE REVERSE SIDE INCLUDES AN ARTIFICIAL WATERMARK." The check number is 123251, dated 10/23/2002, for an amount of \$1,431.00. The payee is redacted. The signature is redacted. The MICR line at the bottom is ⑈ 0000143100 ⑈.

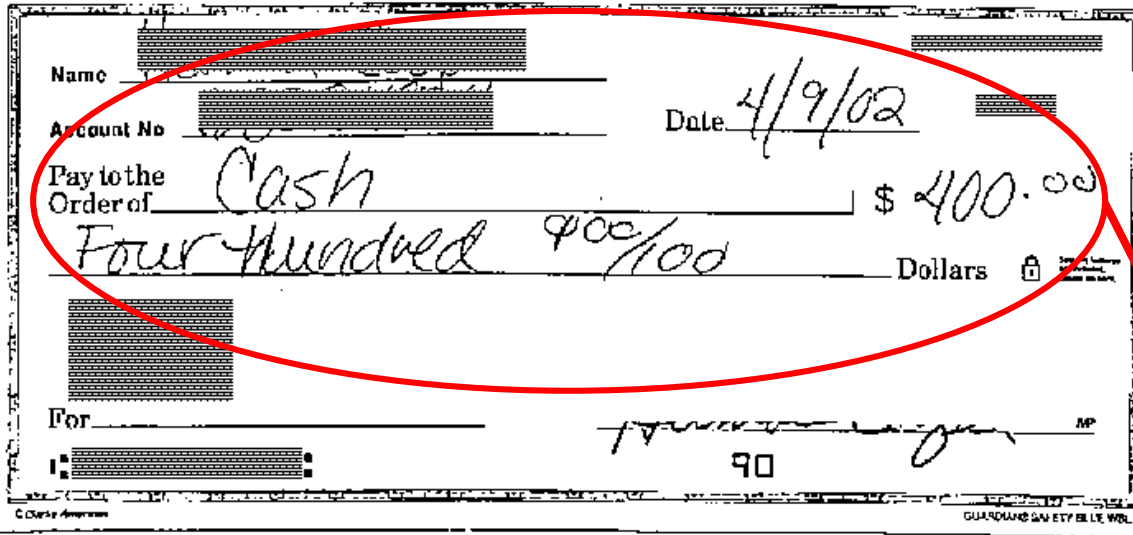
Stock Validation
score = 0

Perpetrator focus
on signature
forgery

Global Properties – Personal Check Example

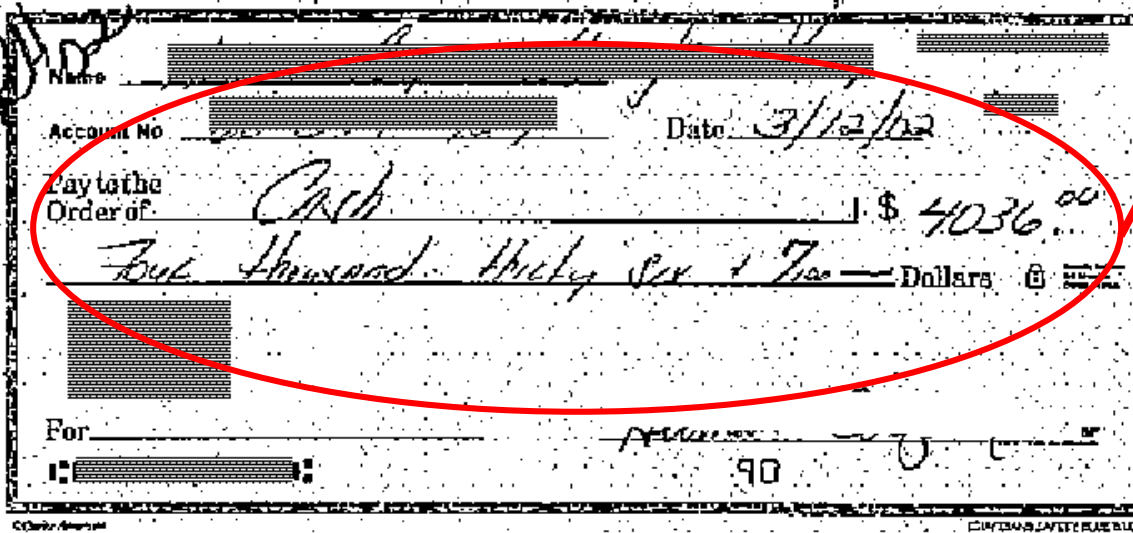


Global Properties = Mathematical representation of writing



Global Properties
Score = 0

Fraud !!!



Global Properties – Business Check Example



Legal amount **Courtesy amount** **Check number**

Payee and Address

PAY *****35 DOLLARS 72 CENTS *****35.72 *****

021 PH 651190

0220377- CRISTINE ROBERT W
1319 E HILLSBORO BLVD APT 609
PAY To DEERFIELD IL 60015
Order Of 33441

09946506

- For a business check, Global Properties includes the fonts and formats used in the variable data fields

Payee Recognition – Personal Accounts



- Recurring payees represent ~80% of all payees for personal accounts
- Recognizing the payee establishes prior relation with account
 - Very low likelihood of fraud

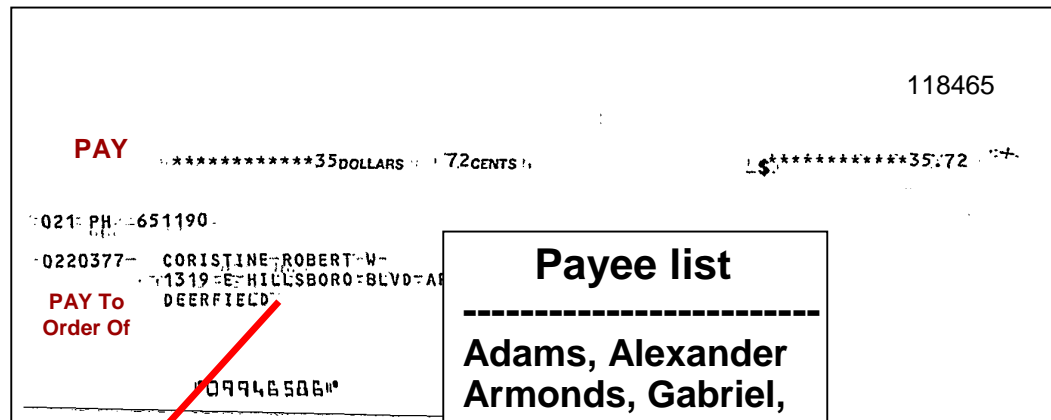
Banks / Loans Bank One

Credit Cards Discover Card Platinum

Phone Companies AT&T Wireless

Merchants Wal-Mart

Payee Recognition – Business Accounts



Use check number and amount to correlate with payee in issue file

Verify that payee on check exactly matches payee in issue file

Preauthorized Draft Example



Normal check for account

11552

CHECK NO. 00011552

PAY **EIGHT HUNDRED EIGHTY-FIVE AND 18 / 100 Dollars**

DATE **07/05/02** AMOUNT *******885.18**

TO THE ORDER OF

AUTHORIZED SIGNATURE

Security features. Details on back.

⑈011552⑈ ⑈0000088518⑈

Stock Validation score = 0

Pre-authorized draft

555

Date September 19, 2002

Pay to the Order of **SPRINTPCS** \$ **\$100.00**

** One Hundred and 0/100 ***** DOLLARS

Conf # 0094687111 100.00 IVR

Verbally Authorized By Your Depositor

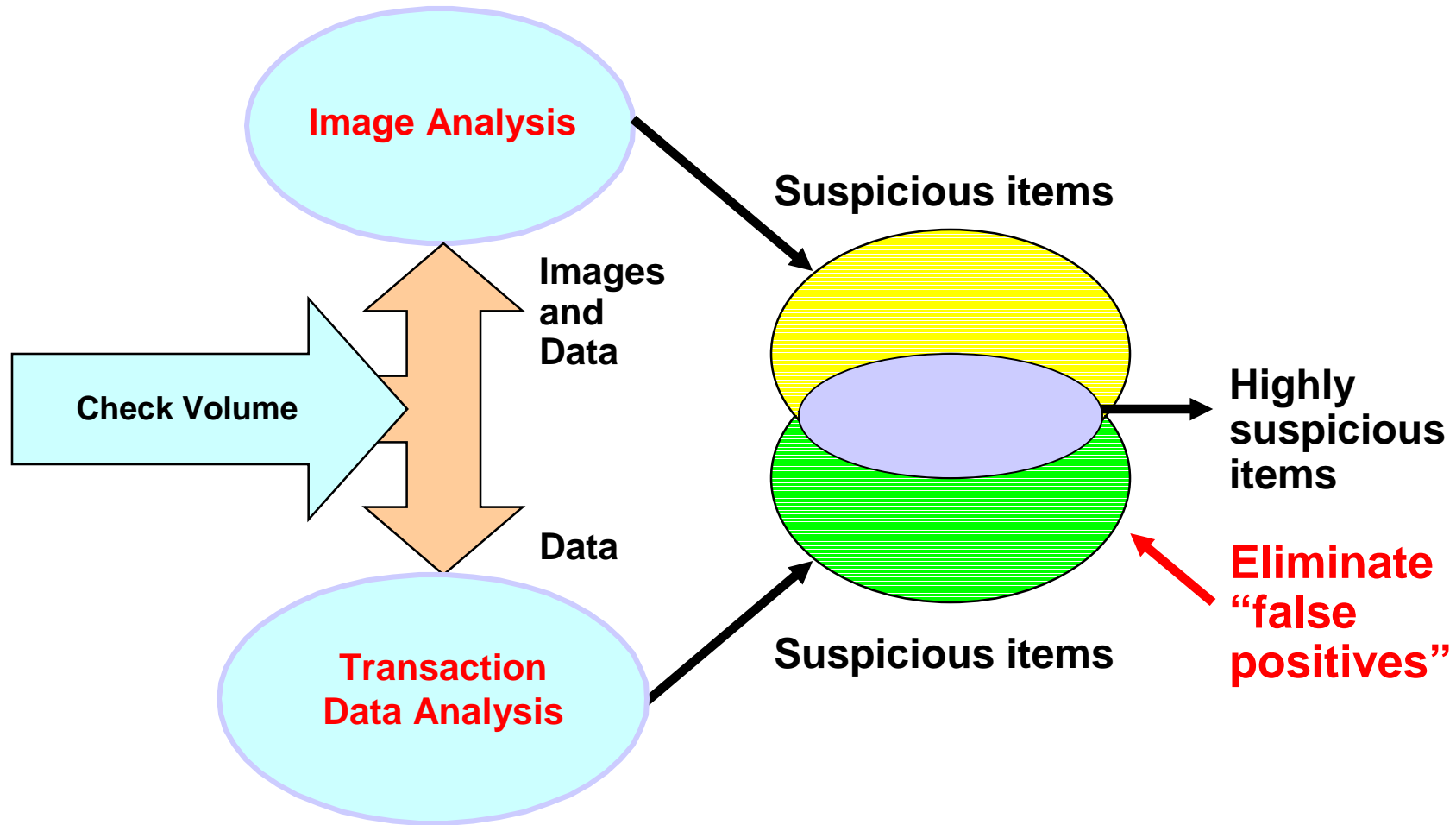
⑈0000010000⑈

November 10, 2003 Image Technologies to Detect Fraud

Suspect payee!

Relationship to Other Initiatives

- **Image and Data Analysis Integration**
- **Image Survivable Security Features**
- **Account Information Sharing**
- **Technology Alliances**



Potential to lower data analysis amount thresholds and use image analysis results to eliminate most false positives

- **FSTC project underway to evaluate current and proposed check security features in an image environment**
 - **The ability to detect whether a check is genuine and unaltered from an image would have obvious benefits for fraud detection**
- **Issues to be addressed include:**
 - **Will they survive image capture?**
 - **Can they be verified by the bank of first deposit in a fully automated environment?**
 - **Do the features survive equally well in both black and white and gray scale image environments at various resolutions and across multiple generations?**
- **Intent of the study is to address utility, cost and risk issues**

- **National Fraud Data Bases**
 - **New accounts**
 - **Hot files**
 - **Consolidation of cases across geography/financial institutions for better prosecution**

- **Changes in the payments system demand a holistic fraud prevention tool that looks at all transactions regardless of payments channel**
- **New technologies and the need to integrate them across multiple tools and processes require a greater use of alliances to provide comprehensive and cost effective solutions**

Thank You!



Questions?

Dick Clausen – Bank of America

Jeff Bottari – SOFTPRO North America

Jim Mason – Computer Sciences Corporation