



DIGIMARC

Digital Watermarking Review

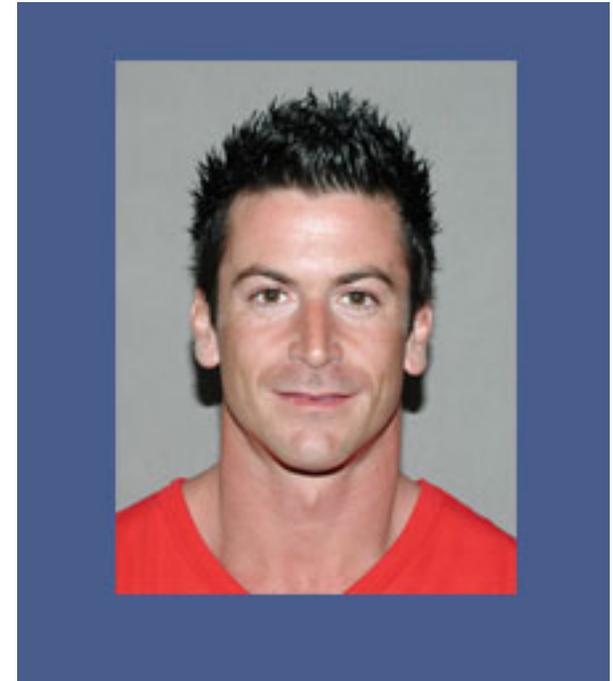
NIST

October 7, 2004



- What is digital watermarking technology?
- Value of digital watermarking in IDs
- Digital watermarking as security feature in ID cards
- Digital watermarking for added security in chip-based cards
- Digimarc

- Covert Digital Identifier Woven Throughout Image
 - Imperceptible
 - Machine Readable
- Carries Unique Identifier / Message
- Survives for Life of Document
- Data Repeated Throughout Image(s)



Apply covert digital watermark

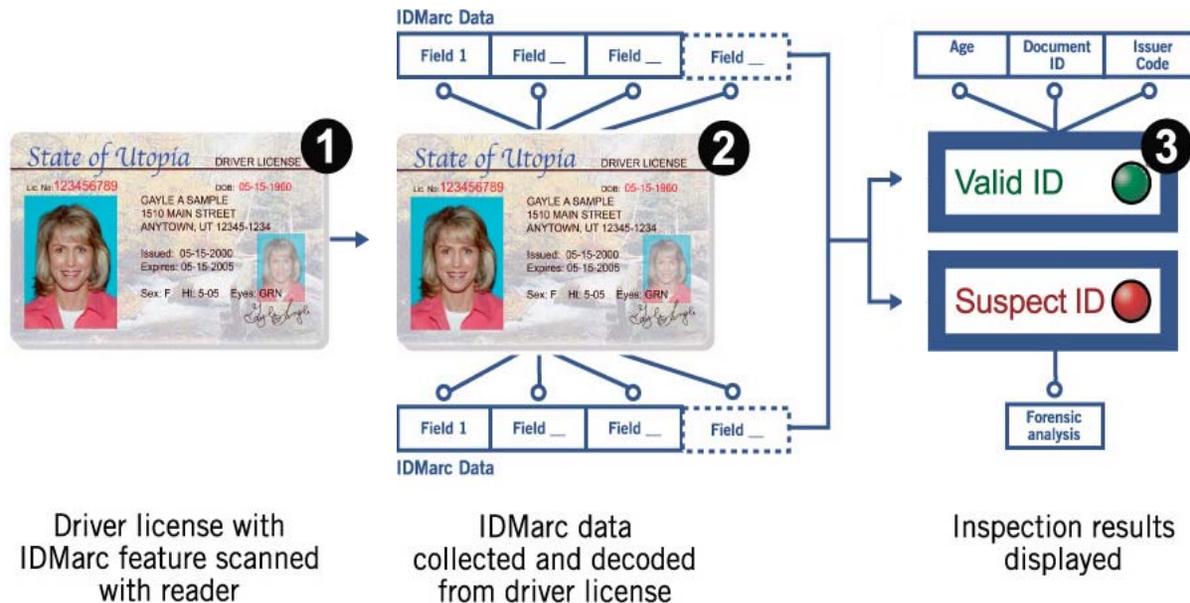


- Digital watermarking has unique value in covertly embedding data in printed material for added security
 - Counterfeit deterrence
 - Central banks
 - Authentication
 - Compare embedded data in image (picture) or graphic to others
 - Fraud detection
 - Document alteration
 - Document tracking
 - Chain of custody

- Transforms multiple, passive elements of identity documents (such as photo and images) into personalized machine-readable security tokens
- Applied with digital printing
 - Unknown to operators
- Creates covert, multi-layered web of intrinsic security by linking these tokens
 - Can link with chip and/or 2D bar code
- Offers strong protection against counterfeiting, forgery, and identity fraud
- Enables self-authentication and aids in forensic analysis of suspect IDs



- Digital Watermark embedded in facial image and artwork
- Cross-jurisdictional authentication, defending against counterfeiting and tampering
- No change in existing card designs
- Combats identity theft / fraud; enhances Homeland Security; assists law enforcement
- 10 states and two international programs, representing 20% of annual U.S. issuance volume (14mm/year), have adopted
- Create taxonomy of identity in breeder document chain:
 - TWIC, Government IDs, DLs, Passports/Visas



IDMARC ENABLED DIGITAL SECURITY LAYERS

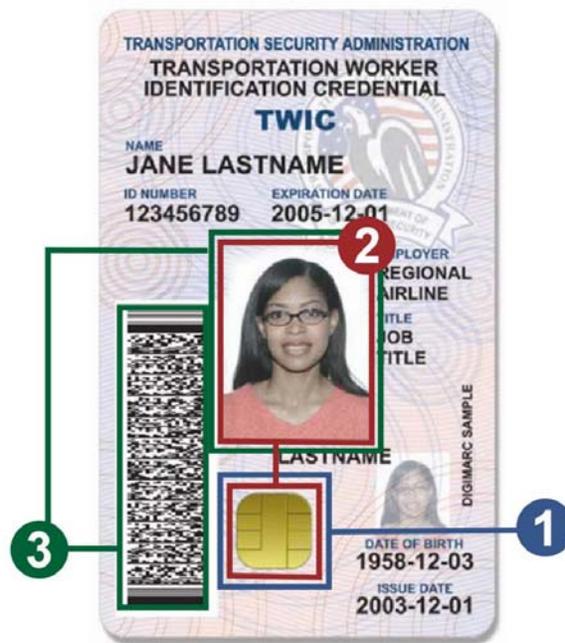
- 1 Interlock digital image and chip.**
Embedding the serial number of the chip (or other unique identifier) in the image stored on the chip ensures no image modification has taken place and the chip is original and not a substitute.

AND

- 2 Interlock chip and photo.**
Embedding the serial number of the chip (or other unique identifier) in the printed image provides the benefits of **1 plus** effectively links the chip to the document data while enabling detection of photo substitution.

AND/OR

- 3 Interlock photo and 2D Barcode.**
Embedding critical data from the 2D barcode in the printed image, provides the benefits of **1 plus** enables cross jurisdictional verification of the ID card at inspection points not equipped to read the chip.



Absence of Digimarc® IDMarc™ indicates document tampering or simulation.



- Embed Data (Unique Identifier) in Digital Image on Chip
 - Enhances Security of Data
 - Links Image to Specific Chip
- Embed Data (Unique Identifier) in Printed Image
 - Links Chip and Plastic Card
- Verification Identifies:
 - Alteration / Replacement of the Facial Image
 - Counterfeiting of the Chip
 - Provides Security if Chip Fails
- Verification Possible by:
 - Field Officer at Control Point
 - Law Enforcement Officer
- Enhanced Forensic Analysis

- World leader in digital watermarking technology
- Leading supplier of security solutions based on watermarking technology
- Leading supplier of driver license issuance systems in U.S. (>60% share)
- Secure personal identification system supplier in more than 20 foreign countries
- Financially strong with \$85 mm annual revenues, profitable, healthy cash position
- 450 employees; headquartered in Tualatin, OR
- NASDAQ: DMRC





DIGIMARC®

THE LEADER IN DIGITAL WATERMARKING AND A LEADER
IN SECURE PERSONAL IDENTIFICATION SYSTEMS

Thank You