



Lumidigm®

Identify Anyone, Anytime, Anywhere

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Lumidigm- A Summary

- Creates and deploys *biometric sensors and solutions*
- Located in Albuquerque, New Mexico
- Mission: *Real World Effectiveness™*
- Target Markets: *Civil ID, Government/Commercial Physical Access*
- 2006 Achievement: Deployed the largest commercial biometric solution at an international theme park.
- *Team*: 32 people full time (about +1/month)
- *Investors*: Intel, Motorola, and several A-class VC
- *Government customers*: U.S. Air Force, Navy, Army, CIA, and NSA



Major Deployment



The Lumidigm Advantage

Fingerprint Sensors for the Real World

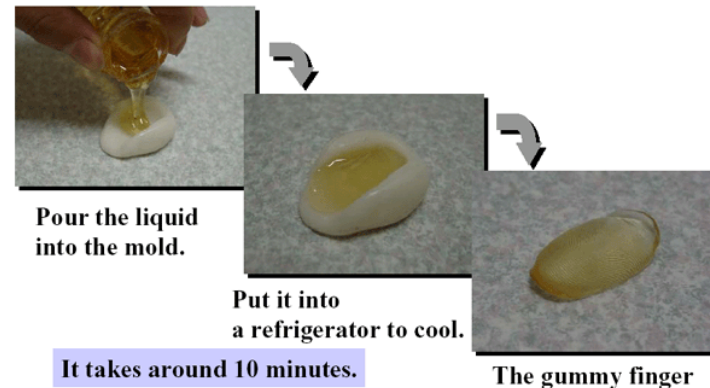
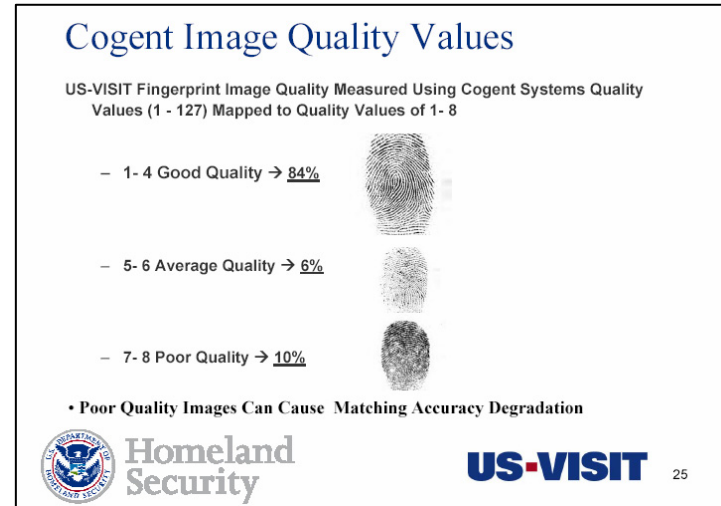
Biometrics are tools for **convenient**
authentication and identification

Market Opportunity

Poor quality prints impact performance

- Dry skin
- Wet skin
- Poor contact
- Poorly defined fingerprint features

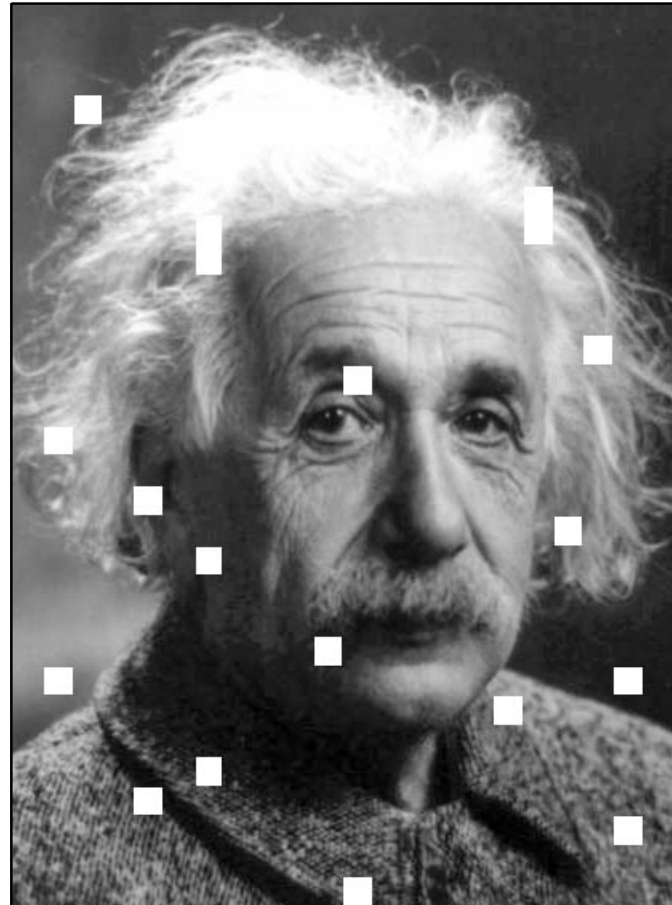
Current fingerprint sensors are susceptible to spoofing”



Insufficient Data = Bad Outcomes

Why are poor/incomplete fingerprint images a problem?

- Poor basis for evaluations/decisions
- High rejection rates
- Low throughput
- Significant training and supervision required
- *Failure to Enroll* — inability to enroll some users
 - Typically 2%-5% of population
 - Workarounds (parallel systems) or wave-throughs are required

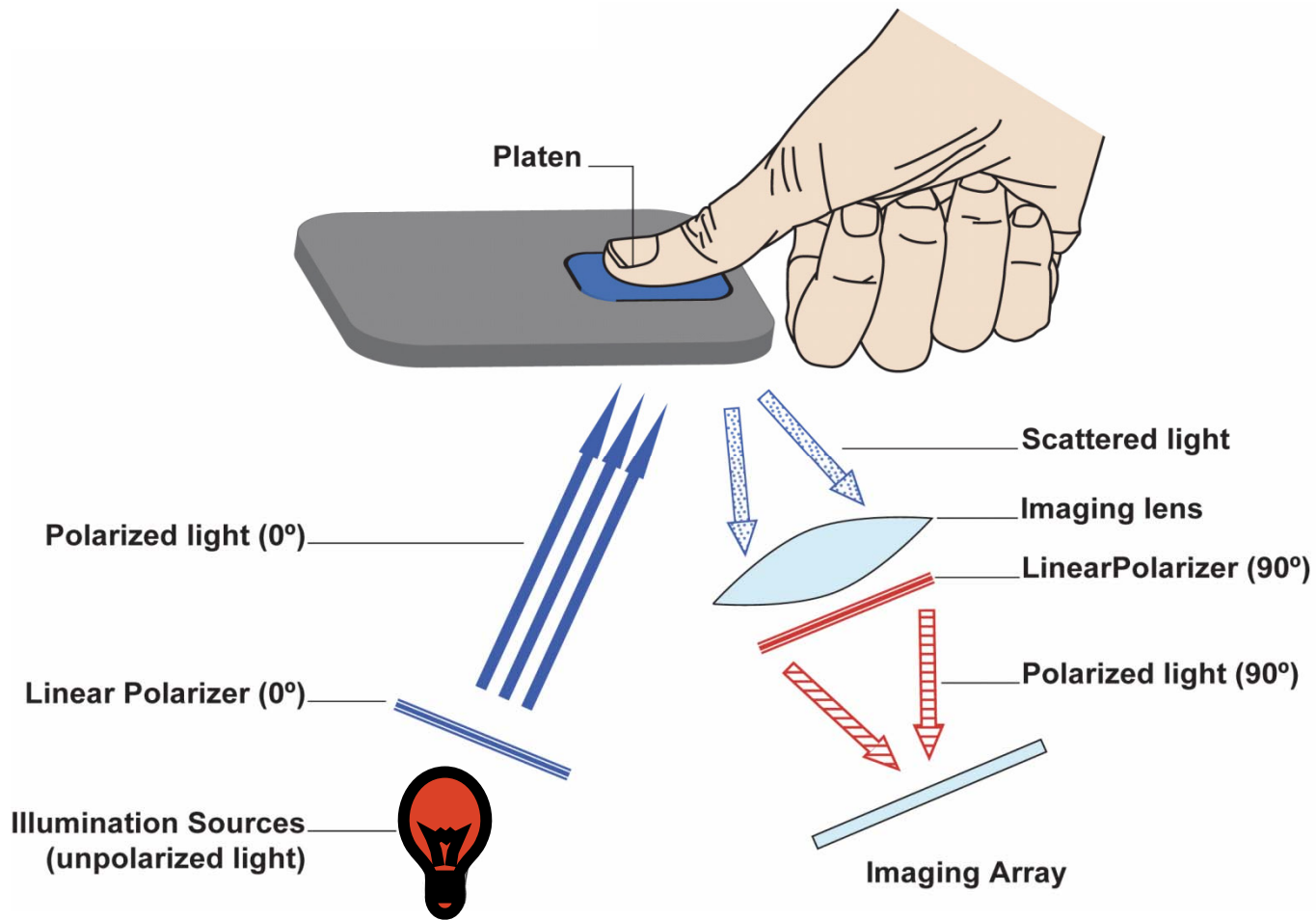


Multispectral Imaging

Optical fingerprinting using *multiple images* taken on a *single sensor* during a *single placement*

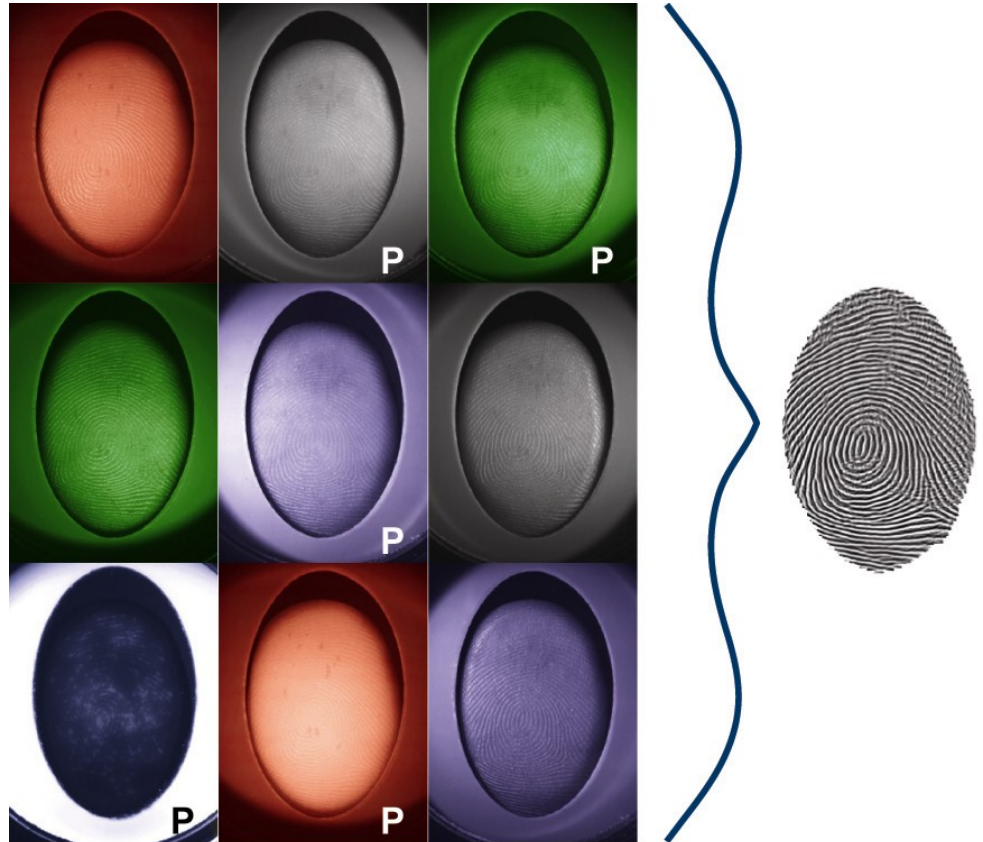
- Multiple images
 - Different illumination wavelengths
 - Different polarization conditions
 - Different optical geometries
 - Surface and subsurface features
- Single sensor, single placement
 - No extra user actions
 - Fast acquisition

Simple System Architecture



Multispectral Imaging

Different colors of light penetrate skin to different depths. Surface and subsurface structures are imaged and the resulting data is combined to create a high-quality fingerprint image every time.



The Lumidigm Advantage

Fingerprint Sensors for the Real World

1. Lumidigm sensors *eliminate performance problems* associated with poor images.
 - High-quality images can be captured by Lumidigm sensors even when fingerprint ridges are hard to distinguish due to genetics, age, dirt, finger placement, or environmental conditions.
2. Lumidigm sensors are *spoof-proof*.
 - The subsurface data that Lumidigm's sensors collect are virtually impossible to replicate.
3. Lumidigm sensors are *user-friendly*.
 - Users need not be told to press down a certain way, moisten their dry hands, or go through an alternate system because of worn prints.
 - Enrollment is quick, easy, and **universal**.

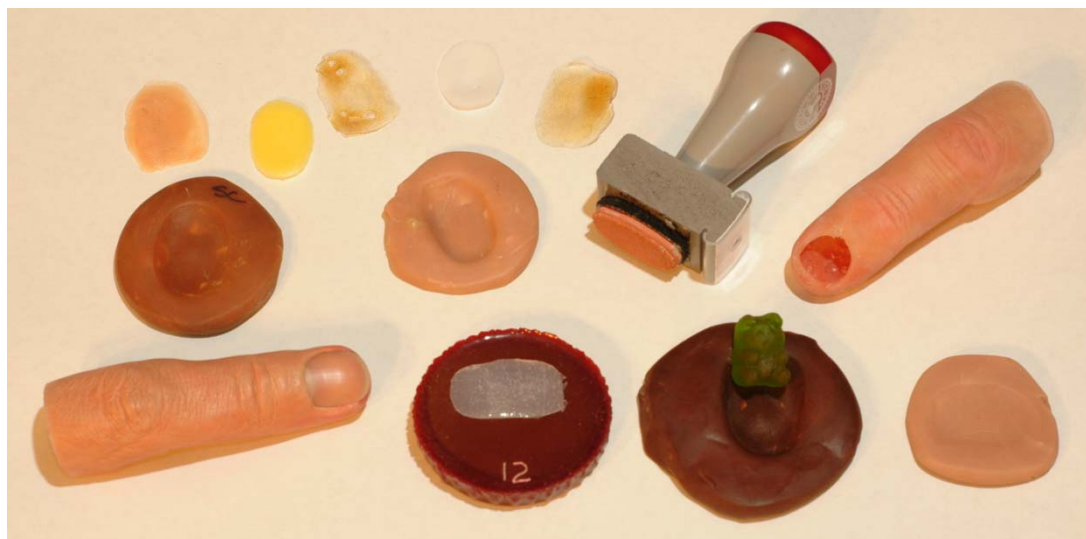
State-of-the-Art Spoof Detection

Spoof Detection Performance

- Over 23,000 spoof images were collected
- Multiple examples of: clear latex, clear silicone, “flesh” latex, gelatin, gummy, tape, rubber stamp, prosthetic, clay, playdoh, glue

Spoof Results

FRR = 0% FAR = 7%
FRR = 0.01% FAR = 2.7%
FRR = 0.1% FAR = 1.2%
FRR = FAR = EER = 0.6%



J-Series Fingerprint Sensors

- *Field Proven!*
- Best image quality in the industry
- Works in any environment
 - Direct sunlight
 - Rain
 - Extreme temperatures
 - Desert conditions
 - Humid/tropical conditions
- Award-winning spoof detection
- Large successful deployment at a major theme park
 - Outdoors—full exposure
 - ~ 200,000 users daily
- Selected by R&D Magazine as one of the 100 most technologically significant new products of the year!

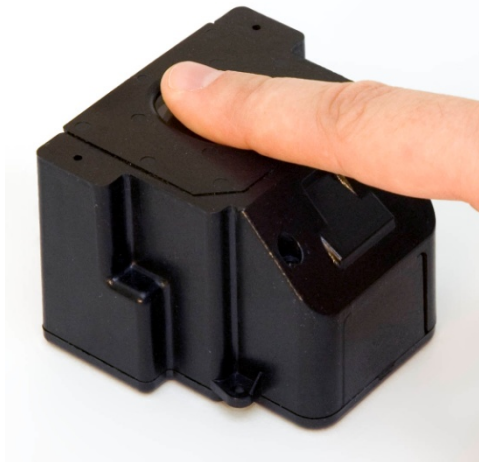


New Product Venus



Product

- Civil ID / OEM module
- Greatly reduced form factor
 - 2.5" W x 2.5" L x 1.75" H
 - Greatly reduced cost
 - USB bus powered
 - Interfaces
 - USB 2.0
 - RS-232/RS-485
 - Weigand
- Evaluation Units now
- Production June, 2007



Lumidigm Provides Consistent Image Quality that Greatly Improves System Performance — Every Time!

