

Touchless 3D – A New Dimension in Fingerprint Technology

Technology, System Approach & Security Aspects

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- Introduction
 - Biometrics Today – Expectations and Reality
 - Fingerprint – What Else?
 - Processes & Parameters
 - Security Aspects
- TBS Technology
 - Touchless Technology Basics
 - Advantages of Touchless 3D Technology
 - Technology Comparison
- From Sensor to System
 - Markets & Applications
 - Sensors → Terminals → Solutions!
 - The New Device Line 2012

Introduction to Biometrics

Biometrics is key to solve security challenges of the 21th century
→ Reality or Fiction?

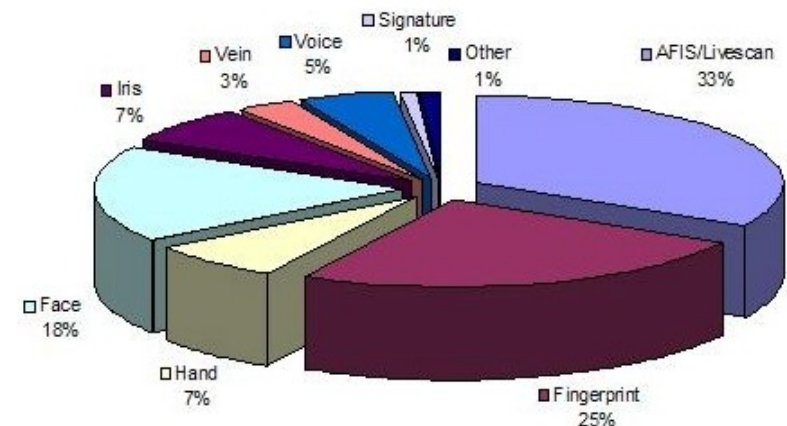
- PRO:
 - Makes secure identification possible, eliminates weak identification
 - Unique, constant and always available
 - Flexible, can be adapted to situation and user group
 - Can be combined with other systems to increase security
 - Convenient and User friendly
- CONTRA:
 - Some technologies not mature yet
 - Market consolidation has just started
 - Not deterministic, identification based on probabilities

→ Biometrics is just one aspect of a sophisticated security concept!

Fingerprint – What Else?

- Fingerprint
 - most adopted technology
 - Fingerprint is unique, constant and can be captured fast & easily
 - mature algorithms & broad range of sensors available
- Face Recognition
 - Emerging technology, driven by security requirements in public areas ('Detecting the face in the crowd')
 - Limited accuracy und feature uniqueness
 - Medium to high price segment
- Iris Recognition
 - Highest accuracy, but not user friendly and with acceptance problems
 - High price segment
- Others
 - Hand/Finger Vein, Hand geometry etc.
 - Limited accuracy and acceptance

→ Fingerprint still takes more than 50% of market share!



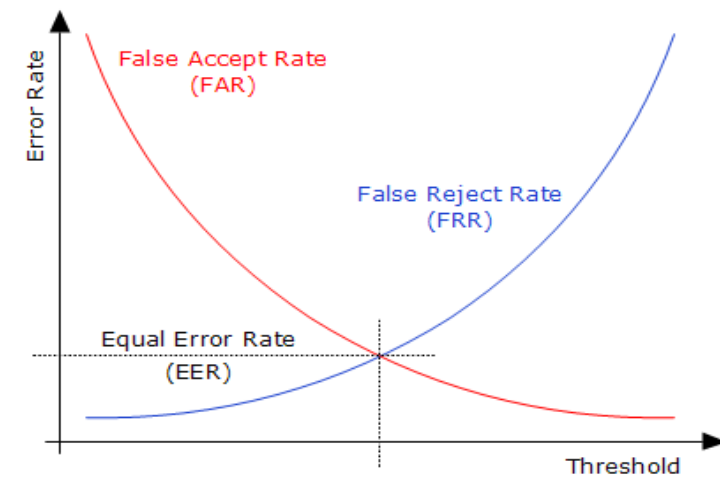
- Enrollment (User registration)
 - User data registration and capturing of biometric reference data ('Reference Template')
 - crucial importance for overall system performance

- Matching (User identification or verification)
 - Comparison of live captured sample with reference data

 - Verification (1:1)
 - requires second token to preselect user list
 - comparison against preselected biometric data only
 - lower requirements regarding system accuracy and speed

 - Identification (1:N)
 - no preselection
 - comparison against reference data of all users
 - high requirements regarding system accuracy and speed

- Biometrics is based on **probability** of user recognition (not deterministic)
- Performance defined by system accuracy (sensor, algorithm) and speed (interface, platform, software)
- Accuracy can be measured using statistical parameters:
 - False Rejects \rightarrow FRR
 - False Accepts \rightarrow FAR
 - Equal Error Rate defines final parameter for comparison
- Speed can be measured directly:
 - Enrollment process time
 - Verification process time
 - Identification process time



A system is as secure as its weakest part!

- Biometrics is part of a total security solution
- Must not limit system security

Risk factors:

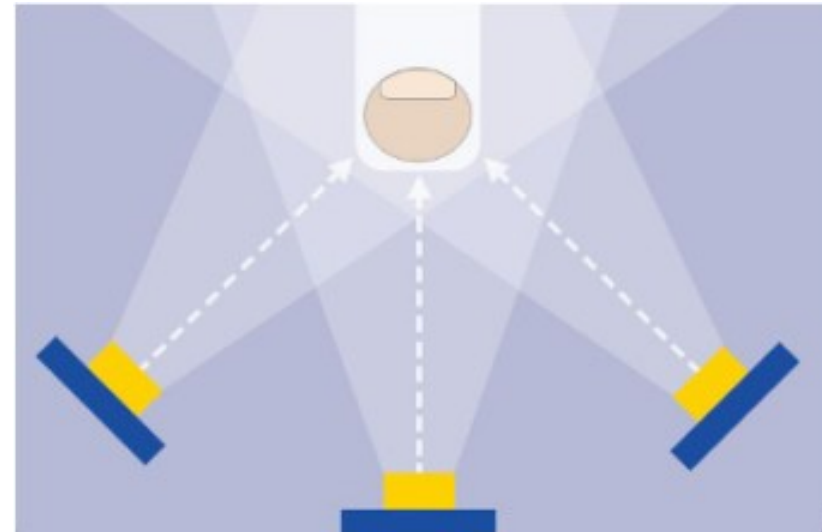
- Data Security
 - Secure data storage
 - Secure data transfer
 - Can biometric data be interpreted and repeated?
 - Can biometric data be revoked?
- Process Security
 - Is biometric process stable?
 - Is biometric process safe against spoofing?

TBS Technology

Touchless Technology Basics



- founded in 2003, focusing on development of a new and unique fingerprint sensor
- Worldwide unique technology
- 3 cameras surrounding the finger
→ TBS Surround Imager
- Finger imaging instead of finger printing
- Complex illumination process



- Full-3D and Approx-3D variants, depending on application
- Full-3D to create rolled equivalent fingerprints
- Compliant to 2D technology (touch-based)
- Approx-3D to extend and optimize center image

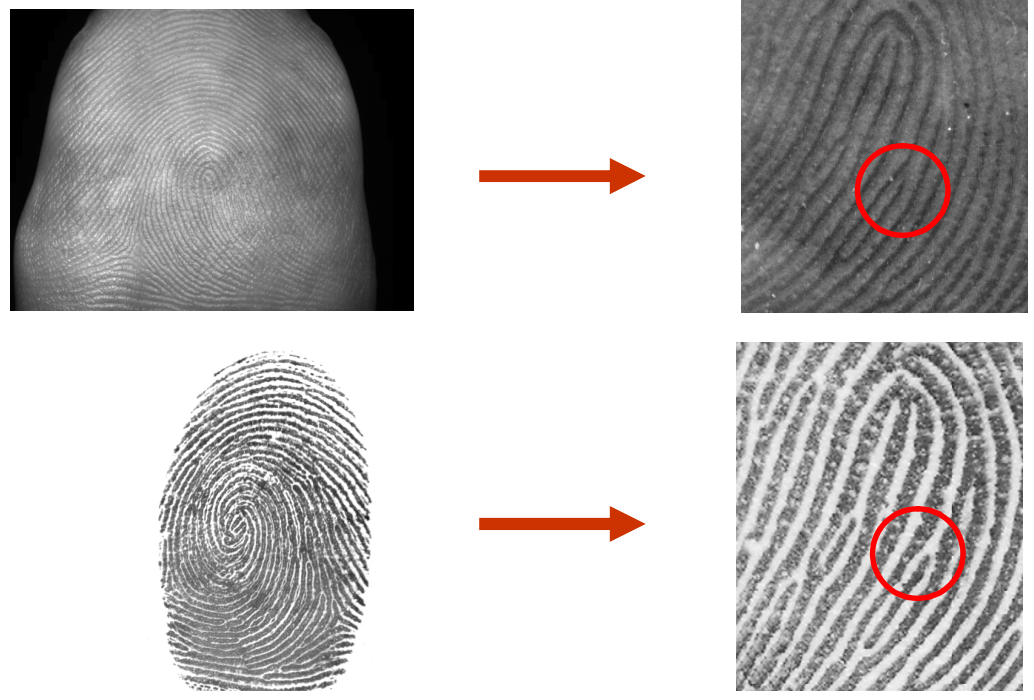
- Superior image quality
 - No Failure-To-Enroll
 - Able to handle critical fingers
- Unparallel image stability
 - Non-intrusive capturing process
 - Almost not affected by finger condition
- Larger capture area
 - Full-3D is able to provide almost nail-to-nail images
 - Approx-3D captures significantly bigger area than touch sensors
 - More indications available than just fingerprint
- Build-in user guidance
 - Self-learning experience
 - Avoids sensor misuse
- Mature Life Finger Detection

Consequence:

Better matching performance → Higher Process Security

Technology Comparison

- Accuracy



- Compatibility



From Sensor to System

- Access Control and Time & Attendance
 - Early adopter of new technologies
 - Small to medium sized applications
 - Targets mainly on single factor identification
 - Networked environment
 - Biometric (sub)system required, rather than sensors
 - Focus on Process Security

- Civil, Governmental and Criminal ID
 - Long term business
 - Large sized applications
 - Targets mainly on AFIS infrastructures
 - PC based environment
 - High-Quality biometric sensors required
 - Focus on Data Security

Heterogenic markets require heterogenic solutions:

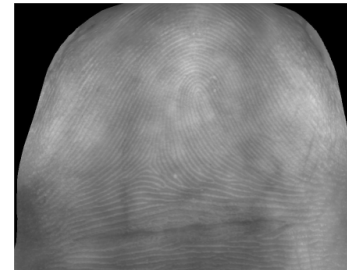
- Full-3D sensor to create perfect 3D and rolled fingerprint



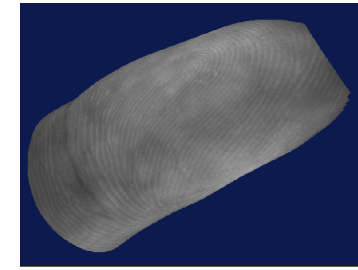
3D-Enroll LP



Demo SW / SDK



Rolled Equivalent



3D (VRML)

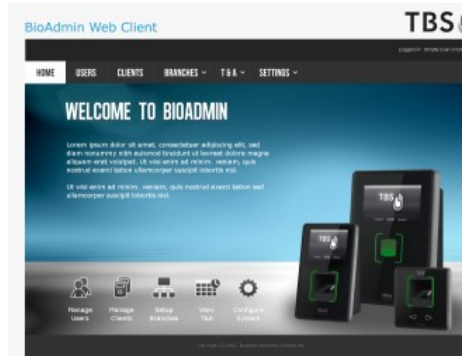
- Approx-3D based terminals plus web software to form a complete biometric subsystem with well defined interfaces



3D-Enroll



3D-Terminal



Web Software



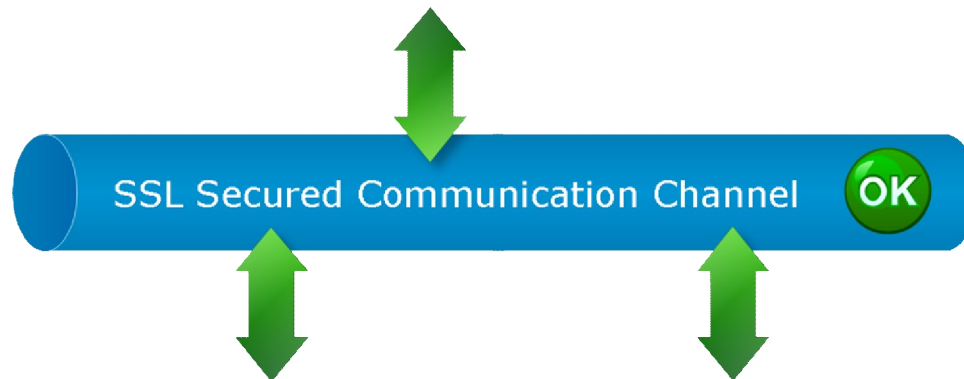
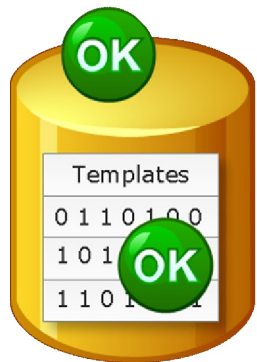
Turnkey Solution

Sensors & Solutions with 3D and 2D technology ...



... Consequently focusing on Data Security:

- Template encryption
- Database encryption
- Channel encryption



... And Process Security:

- Superior image quality and stability
- Mature Life Finger Detection
- Better handling of critical fingers
- Etc.

Thank you!

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