

Understanding Hand Scanning

This biometric approach uses the geometric form of the hand for confirming an individual's identity. Because human hands are not unique, specific features must be combined to assure dynamic verification.

Some hand-scan devices measure just two fingers, others measure the entire hand. These features include characteristics such as finger curves, thickness and length; the height and width of the back of the hand; the distances between joints and overall bone structure.



It should be noted that although the bone structure and joints of a hand are relatively constant traits, other influences such as swelling or injury can disguise the basic structure of the hand. This could result in false matching and non-false matching, however the amount of acceptable distinctive matches can be adjusted for the level of security needed.

To register in a hand-scan system a hand is placed on a reader's covered flat surface. This placement is positioned by five guides or pins that correctly situate the hand for the cameras. A succession of cameras captures 3-D pictures of the sides and back of the hand. The attainment of the hand-scan is a fast and simple process. The hand-scan device can process the 3-D images in 5 seconds or less and the hand verification usually takes less than 1 second. The image capturing and verification software and hardware can easily be integrated within standalone units. Hand-scan applications that include a large number of access points and users can be centrally administered, eliminating the need for individuals to register on each device.

Applications for Hand Scanning

Internationally, many airports use hand-scan devices to permit frequent international travelers to by-pass waiting lines for various immigration and customs systems.

Employers use hand-scan for entry/exit, recording staff movement and time/attendance procedures. This can go long way to eradicating the age old problem of buddy-clocking and other deceptive activities.

Combining Biometric Methods

Hand-scanning can be easily combined with other biometrics such as fingerprint identification. A system where fingerprints are used for infrequent identification and hand-scanning is used for frequent verification would create a two tiered structure. The hand-scan component used frequently allows identity verification or 1:1 (one to one) verification that ensures the user is who they claim they are. The fingerprint identification component used infrequently, confirms who the user is and accurately identifies the user in a 1:N (one to many) identification that is compared with numerous records.

[back](#)

Showcases

- Fingerprint
- Iris Recognition
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- Facial Recognition
- Voice/Speaker
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- Smart Cards/Multimodal
- Signature/Keystroke
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Hand Geometry - Now and in the Future

Some anthropologists suspect that human intelligence has evolved due in large part to the shape of the hand.

While the hand hasn't changed much in a long time, it's now being put to a new use, to verify its owner's identity.

How it Works

Every hand is unique. Hand geometry scanners such as those made by Recognition Systems Inc. take over 90 measurements of the length, width, thickness, and surface area of the hand and four fingers—all in just 1 second.



The technology uses a 32,000-pixel CCD digital camera to record the hand's three-dimensional shape from silhouetted images projected within the scanner.

The scanner disregards surface details, such as fingerprints, lines, scars, and dirt, as well as fingernails, which may grow or be cut from day to day.

When a person uses the scanner, it compares the shape of the user's hand to a template recorded during an enrollment session. If the template and the hand match, the scanner produces an output—it may unlock a door, transmit data to a computer, verify identification, or log the person's arrival or departure time.

During enrollment, which takes approximately 30 seconds, the user places the right hand in the reader three times. The unit's internal processor and software convert the hand image to a 9-byte mathematical template, which is the average of the three readings.

The user's template may reside in internal memory (capable of holding over 27,000 users), or on other media such as a hard disk or smart card chip.

Enhanced Biometric Technology

Recognition Systems Inc. significantly enhanced biometric technology for its hand scanners. By maintaining a low False Reject Rate (the probability that the device will reject an authorized user), while maintaining a high deterrent to unauthorized access, RSI's units process large numbers of people with minimal delays.

The crossover of False Reject and False Accept rates for RSI's hand geometry readers is 0.1%. These optimal error rates were documented in independent testing at Sandia National Laboratories. Subsequent field results from thousands of users and hundreds of thousands of transactions confirmed the Sandia findings.

Highest User Acceptance

Among biometric technologies, Sandia reported that hand geometry had the highest user acceptance of all devices tested. With a high level of security, ease of use, and non-threatening technology, hand geometry has become the most widely accepted biometric technology in use today.

Applications

RSI hand geometry scanners verify identity at the front entrances of over half the nuclear power plants in the U.S. At the 1996 Olympic Games, RSI's units were

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integrated with the Olympic Village security system to process millions of transactions, with minimum delay.

The U.S. Immigration and Naturalization Service (INS) uses RSI hand geometry scanners to allow over 60,000 frequent travelers to bypass immigration lines (through the INSPASS program).

The drastic reductions in cost of microprocessors in recent years has brought affordable hand geometry technology to the commercial market. Biometrics are no longer found only in nuclear power plants. Day care centers, athletic clubs, obstetrics wards, and police departments now use RSI's scanners.

Tomorrow will find ever-expanding applications for this thoroughly time-tested technology--for financial transactions, ticket-less travel, and new business and residential applications where high security is a major concern.

authentication using fingerprints. The solutions replace keys, PINs and passwords in three areas: IT security, physical access and embedded solutions.

Targus

Targus offers two of the most popular Biometrics devices on the market today: The DEFCON Authenticator with USB Hub and the DEFCON Authenticator PC Card Fingerprint Reader.

[back](#)



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