

# Hitachi develops grip-type finger vein authentication technology

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Hitachi, Ltd. announced the development of a grip-type finger vein authentication technology, which upon gripping of a door handle, instantaneously recognizes the finger vein pattern and confirms the identity of the person trying to enter. Thus, an authorized person only has to grip a door handle to open a locked door to enter a room, home or vehicle.

This system provides a new style of convenience, where authentication is achieved as part of the action of opening a door, providing high security without requiring additional special maneuvers, or the need to carry keys.

This technology will be on public display as part of a car door model with finger vein personal authentication, to be exhibited at the 39th

Tokyo Motor Show 2005, from Saturday, 22 October to Sunday, 6 November, at Makuhari Messe, Chiba, Japan.

Breaking and entering of homes and cars, through picking and other means of illegal entry, have been on the rise in recent years. As a result, there has been a rapid growth in security consciousness. In order to confirm personal identity, attention is being focused on biometric methods such as fingerprint, iris pattern, facial features, vein pattern, etc, which rely on characteristics peculiar to an individual, and thus less easily forged.

Hitachi has been developing an original biometric technology, finger vein pattern authentication, which uses the authenticated finger vein pattern measured from light penetrating a finger, as a key. The fundamental technology was established in 2000, and since then convenience has been pursued, producing a user-friendly "Open-Type" and a flexible "Indoor/Outdoor-Type" which can use natural sunlight as a light source. Finger vein authentication is core technology in Hitachi Group security businesses, and is already finding wide application in a number of products such as Automatic Teller Machines for financial institutions, door-access control, PC log-in control, etc.

In addition to increasing equipment-level security, entrance security to facilities, homes, cars, etc. was also considered as important need. This led to the development of the grip-type finger vein authentication system. By incorporating this system into a door handle, an individual's identity can be confirmed by simply gripping the handle, without any additional maneuvers such as entering a Password number, as well as preventing illegal entry through the use of stolen or forged keys.

Features of the technology developed are as below:

- (1) Authentication method using the finger vein pattern on the back-side

of the finger

The initial finger vein pattern recognition technique developed, images the finger vein pattern on the palm side of the finger for authentication. In the action of gripping, however, as the finger veins on the palm side are compressed and deformed, it is difficult to obtain a standard image. Conversely, it was found that as the finger veins on the back-side of a finger are stretched during gripping action, a bright and clear vein pattern could be smoothly imaged by placing the light source on top of the handle in natural close proximity to the position of the finger to be imaged.

(2) Door-handle design guiding the finger to a fixed position

Accurate authentication cannot be conducted if the finger or part thereof being imaged changes each time. To ensure that the same part of the same finger is imaged every time, a door handle was designed which guides the fingers to the same position each time the handle is gripped. A compensation technique using image processing is also employed to further enable stable authentication results.

The grip-type finger vein authentication equipment developed is security technology which provides a convenience hitherto unavailable, and is expected to find wide range of applications. Hitachi is planning to develop practical applications of this technology for cars and homes.

Source: Hitachi, Ltd.

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