

**Personal authentication, explosives detection and suspect tracking
technology for enhanced security service
in large-scale important facilities**

Raising safety levels without reducing convenience in crowded environments

Tokyo, March 11, 2014 – Hitachi, Ltd. (TSE: 6501) today announced the development of three new technologies: “finger vein authentication technology for touch panels,” “dangerous substance detection technology for simultaneous inspection of multiple locations” and “suspect tracking technology based on clothing, hand luggage and route taken,” to enhance security without detracting from convenience in large-scale important facilities where crowds gather, such as event halls and airports. The integrated IT management of these technologies opens the way to a new security service for large-scale important facilities such as tracking the movement of a person who has handled dangerous substances and determining the suspect’s current location.

In addition to measures such as increasing security personnel, full use of IT and leading-edge science and technology is indispensable for preventing unforeseen incidents or accidents in large-scale important facilities such as mega-event halls, sports facilities, airports and railway stations, where a large number of people come and go. Currently, IC-chip based personnel authentication, dangerous substance detection technology, network camera based suspect-tracking technology, etc. are in use, however, in wide areas where a large number of people come and go, even more sophisticated security technology is necessary to “quickly and reliably confirm identity,” “detect suspicious objects within a wide area” and “track suspects even when facial recognition cannot be achieved.” Customer convenience is compromised however if for the sake of increased security, the flow of people stagnates. To expand business in security services, Hitachi believes that security technology for large-scale facilities providing safety, convenience and speed will be required. Given this background, security technology was developed to increase safety and convenience in the 3 security areas of personal authentication, dangerous substance detection and suspect tracking for large-scale facilities where people congregate.

(1) **Touch panel finger vein authentication technology for vein authentication while entering passcode**

Finger vein personal authentication technology was developed which provides highly accurate personal authentication while entering a four-digit passcode for admission to a facility. The technology employs a transparent touch panel, and allows light to pass through the panel to capture the finger vein image while a person is touching the panel. The image captured is then verified against a pre-registered finger vein pattern to confirm identity. As finger vein authentication can be performed while entering a simple passcode, personal identification can be achieved with high accuracy without stalling the flow of people.

(2) **Dangerous substance detection technology capable of simultaneous inspection of multiple points within a facility using one mass spectrometer**

Using mass spectrometry equipment with multiple air suction pipes, technology

was developed to quickly and efficiently detect the presence of dangerous substances from multiple points within a facility. With this technology, to conduct efficient analysis, air samples for multiple points within the facility are collected at the same time using pipes. In order to determine the originating point of an air sample carrying dangerous substances, the combination of air samples being fed from the different pipes are repeatedly re-combined and analyzed. The observed signal is then analyzed using signal processing technology developed to determine the originating point.

(3) **Suspect-tracking technology to identify suspects based on clothing, hand luggage and route taken**

Tracking technology was developed to quickly and accurately identify suspicious persons in a crowded facility even when a facial image has not been captured by a security camera, using fragmented information such as clothing, hand luggage, route taken, etc. In order to efficiently search for an individual from among the large volume of security image feeds, features (shapes and colors) of different body parts (face, head, mouth, upper body, and lower body) can be automatically extracted and stored in a database, as well as information on the route taken and creating a link between the two sets. With the linked information, conditions such as “upper half: blue shirt,” “lower half: black trousers,” “green bag on back” and “walked down the corridor” can be set for a search.

By integrating the three new security technologies developed through IT, it becomes possible to know from which person’s luggage dangerous substance was detected, which route the person took in moving around a facility, and where the person is currently. For individuals or items which have cleared security through inspection results such as finger vein personal authentication or hand luggage inspection, it will be possible to provide greater convenience high-level security based on the safety assessment such as a walk-through checks based on facial recognition.

New security services for large-scale facilities will become possible by analyzing the safety of individuals or objects in a facility from multiple perspectives and visualizing results. Hitachi plans to conduct multiple pilot tests at several large-scale facilities as it aims to expand business in security services.

The technology developed will be presented at the Technical Committee on Pattern Recognition and Media Understanding (PRMU) of the Institute of Electronics, Information and Communication Engineers (IEICE), Japan, to be held on 13th-14th March 2014 at Waseda University, Tokyo, Japan.

About Hitachi, Ltd.

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 326,000 employees worldwide. The company’s consolidated revenues for fiscal 2012 (ended March 31, 2013) totaled 9,041 billion yen (\$96.1 billion). Hitachi is focusing more than ever on the Social Innovation Business, which includes infrastructure systems, information & telecommunication systems, power systems, construction machinery, high functional material & components, automotive systems and others.

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