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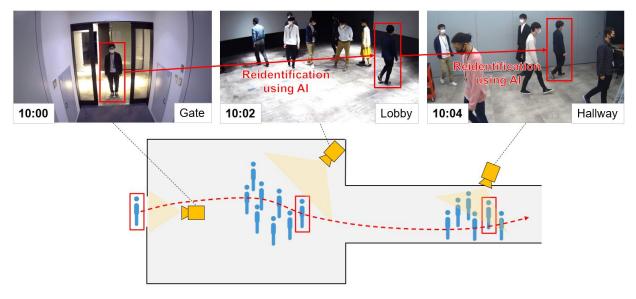   prd.gnews@nk.MitsubishiElectric.co.jp
www.MitsubishiElectric.com/ssl/contact/company/rd/form.html www.MitsubishiElectric.com/news/

Mitsubishi Electric Develops AI Technology for Fast, Accurate Reidentification, Tracking and Searching of Human Subjects
Supports detection and tracking of suspicious persons and lost children using multiple cameras

TOKYO, March 30, 2022 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today that it has developed an artificial intelligence (AI) technology that identifies individuals captured with multiple surveillance cameras in one-tenth time of conventional AI, using special compression technology to eliminate extraneous data and thereby achieve highly efficient and accurate reidentification, tracking and searching that is relatively unaffected by changes in camera angles or poses of human subjects. Mitsubishi Electric expects to provide the new technology in its Maisart®* lineup, including in new security systems for the detection and tracking of suspicious persons and lost children, and in the customer-service field for customer-flow analysis.

* Mitsubishi Electric's AI creates the State-of-the-ART in technology

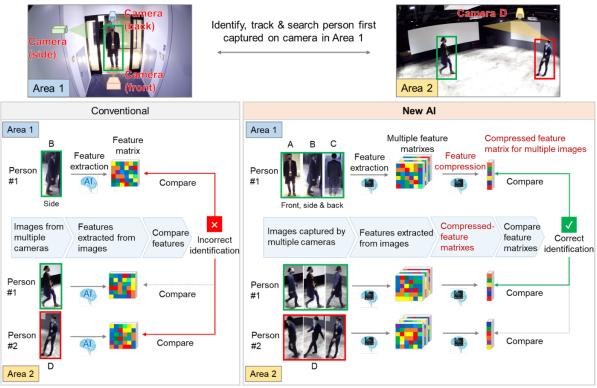Example of new AI technology's repeated identification and tracking of human subject

Features

1) *Proprietary compression technology reduces the time to reidentify individuals to one-tenth*
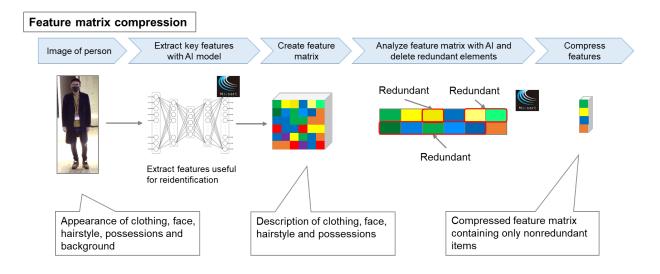
- By analyzing the correlation of multiple features extracted from an image and removing information that is less important for reidentification, the AI compresses data volume to as little as one-tenth conventional data sets, thereby reducing the computational time for reidentification to one-tenth.

- To identify a specific person, the AI first extracts essential features from the person's image, then compares the features using different camera angles to calculate similarities and determine if other images are those of the same person. In general, AI can extract several thousand features from a single image, so if the number of people increases then the calculation can become highly complex. With Mitsubishi Electric's new technology, however, the AI analyzes correlations between multiple features and then removes unnecessary data while retaining a person's salient features.

2) *Fast, accurate tracking and searching unaffected by different camera angles and poses*

- By compressing the data size, the AI speeds up processing of images from different angles and poses.
- Tracking and searching accuracy is improved by reducing the influence of different poses and angles.
- Tracking and search accuracy for single persons is improved by about 10% compared to conventional methods.
- The AI still works even if the person is wearing a mask or clothing similar to those of other persons nearby.

New and conventional AI technologies

Feature matrix compression

Image of person → Extract key features with AI model → Create feature matrix → Analyze feature matrix with AI and delete redundant elements → Compress features

Extract features useful for reidentification

Redundant   Redundant

Redundant

Appearance of clothing, face, hairstyle, possessions and background

Description of clothing, face, hairstyle and possessions

Compressed feature matrix containing only nonredundant items

Future Developments

Mitsubishi Electric expects to develop practical video-analysis systems for surveillance, especially for use in public facilities, taking care to ensure data privacy and compliance with all relevant laws and regulations.

Background

The increasing deployment of surveillance cameras has created new needs for analytics capable of identifying, tracking and searching people, including suspicious persons or lost children, especially in public facilities. Using conventional AI, however, it is the difficult to distinguish people wearing similar clothing, especially when viewed from varying angles or poses captured with cameras monitoring large areas. In addition, identifying individuals using large numbers of camera images takes time, especially if the target person is in the presence of many other people.

About Maisart

Maisart encompasses Mitsubishi Electric's proprietary artificial intelligence (AI) technology, including its compact AI, automated-design deep-learning algorithm and extra-efficient smart-learning AI. Maisart is an abbreviation for "Mitsubishi Electric's AI creates the State-of-the-ART in technology." Under the corporate axiom "Original AI technology makes everything smart," the company is leveraging original AI technology and edge computing to make devices smarter and life more secure, intuitive and convenient.

Maisart is a registered trademark of Mitsubishi Electric Corporation.

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About Mitsubishi Electric Corporation
With 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 4,191.4 billion yen (U.S.$ 37.8 billion*) in the fiscal year ended March 31, 2021. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥111=U.S.$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2021