

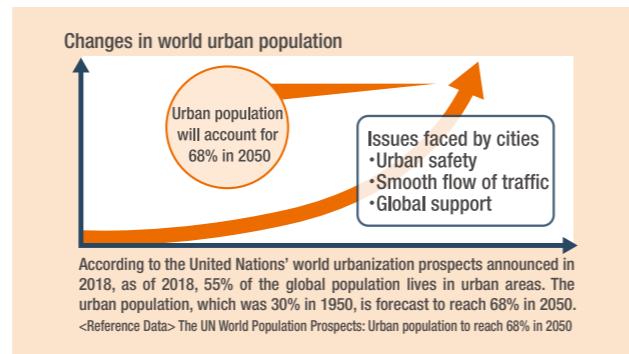
# Provide Safety, Security, and Comfort

## Using AI to Promote Urban Safety, Security, and Comfort

The Mitsubishi Electric Group is working to develop artificial intelligence (AI) technology and to provide solutions that take advantage of AI technology. With Mitsubishi Electric's AI technology "Maisart," the Group will provide safety, security, and comfort in city life and to the lives of people.

### Issues faced by cities and AI's potential for solving such issues

In today's cities, many people gather from around the world and come and go rapidly as a result of globalization. Concentration of people in cities will continue to advance and it is predicted that traffic jams and congestion of public facilities will become even more serious. While the number of people who need support for moving around, such as the elderly, those who use strollers or wheelchairs, and foreign travelers will increase, the shortage of labor able to support such people will increase because of a decrease in labor force. Mitsubishi Electric is striving to develop solutions using AI technology so that people can move around cities smoothly and enjoy active lives.



## Contributing to safety, security, and comfort with "Maisart" brand compact AI

As a result of advances in the IoT, where everything around us is connected to the Internet, we can now collect lots of data from devices. As a result, AI, which is good at handling data, has been put to more practical use. On the other hand, AI generally needs to process a large amount of data on the server and learn from it, which is very costly and requires large-scale servers and network equipment. As such, AI that can be installed on devices is needed.

In response to this issue, Mitsubishi Electric has developed a compact artificial intelligence that can easily be installed on embedded devices, such as on-board devices and FA devices, by reducing computation power used in Deep Learning. Taking advantage of its position as comprehensive electrical and electronics manufacturer producing many devices, Mitsubishi Electric will contribute to providing society with more safety, security, and comfort by applying this AI technology to devices and edge computing to create greater value.



Mitsubishi Electric's proprietary AI technology includes its compact AI. Under the corporate axiom "Original AI technology makes everything smart," Mitsubishi Electric is leveraging original AI technology and edge computing to make all products smarter and life more secure, intuitive and convenient. Maisart is an abbreviation for "Mitsubishi Electric's AI creates the State-of-the-ART in technology."



### Supporting facility users by looking over them with AI to anticipate what support they will need

#### "kizkia" video analysis solution -

The "kizkia" video analysis solution detects attributes of persons or things and automatically recognizes their movements, conditions and situations by analyzing security camera footage in real-time. It gives notice of irregular situations which may require staff intervention but would otherwise be overlooked by human observers. The technology was developed by Mitsubishi Electric Information Systems Corporation, which had been working on the development by leveraging Mitsubishi Electric's proprietary AI technology in an attempt to strengthen its monitoring camera technology that it has developed through experience.

Using "kizkia" makes it possible to support, for example, persons in wheelchairs or those with guide dogs by detecting and anticipating their movements or to protect persons who are sitting for long hours or promptly notice people walking unsteadily. It can also prevent crimes or accidents by detecting suspicious persons or others entering dangerous areas.

Since it is expected that comings and goings in cities will continue to increase, Mitsubishi Electric will accelerate cooperation with facility operators, aiming to practically use the technology for public transportation and facilities.

<b>Detection of persons' attributes</b>	<b>Function:</b> Detects persons' attributes which are previously learned	<b>Attribute:</b> A person with a stroller or another in a wheelchair among the people coming and going	
<b>Detection of things left unattended</b>	<b>Function:</b> Detects things that have been left unattended at the same spot for a certain period of time	<b>Attribute:</b> An abandoned thing that wasn't there a minute ago	
<b>Detection of persons walking unsteadily</b>	<b>Function:</b> Analyzes movement flow lines to detect persons walking unsteadily	<b>Attribute:</b> Unsteady and awkward walking that appears different from other persons walking normally	

### VOICE (In charge of kizkia sales)



**Hironori Suzuki**  
 Deputy Manager  
 Marketing Section A  
 Marketing Department B  
 Industry and Service Systems Division B  
 Industry and Service Systems Group  
 Mitsubishi Electric  
 Information Systems Corporation

Enabling high accuracy learning to differentiate a person with a stick from another person with an umbrella, or a person pushing a wheelchair from another person pushing a shopping cart requires various improvements. In an environment where many people come and go, detection accuracy may be reduced, for example, AI may detect unexpected movement, conditions, and situations of persons or things. In order to apply video analysis to our business, we have been creating practical AI through repeated trial and error in many demonstration experiments and introductions to the real environments, tuning according to the environmental condition, and accumulating our unique know-how for effective learning and improved detection accuracy. On the other hand, video analysis using monitoring cameras is one of the tools to protect the safety and security of public facilities. Considering appropriate operations in terms of how and to whom should detected persons or things be reported, how they should be dealt with, and so on is also very important. Accordingly, we are working to have close discussions with facility operators and make proposals that include details on the flow of operations through conducting demonstration experiments, and so on.

Though "kizkia" is currently used based on video analysis, the potential of AI's detection technology will expand to various fields such as sensors for sound and smell data. In the medium- to long-term, we will skillfully combine these areas to enable more sophisticated support and thereby contributing to providing safety and security.