

MITSUBISHI ELECTRIC CORPORATION
PUBLIC RELATIONS DIVISION
7-3, Marunouchi 2-chome, Chiyoda-ku, Tokyo, 100-8310 Japan

FOR IMMEDIATE RELEASE

No. 3241

Customer Inquiries

Media Inquiries

Information Technology R&D Center
Mitsubishi Electric Corporation
www.MitsubishiElectric.com/ssl/contact/company/rd/form.html
www.MitsubishiElectric.com/company/rd/

Public Relations Division
Mitsubishi Electric Corporation
prd.gnews@nk.MitsubishiElectric.co.jp
www.MitsubishiElectric.com/news/

Mitsubishi Electric Develops Smart, Natural HMI for Smart Mobility

Identifies objects not in driver's sight line and enables verbal, natural dialogs with navigation system

TOKYO, January 22, 2019 – [Mitsubishi Electric Corporation](http://www.MitsubishiElectric.com) (TOKYO: 6503) announced today that it has developed a smart, natural human machine interface (HMI) for cars by applying its Maisart[®] proprietary compact artificial-intelligence (AI) technologies for smart mobility. After recognizing the direction that the driver is facing, the technology uses Smart Notifications to alert the driver about out-of-sight-line objects. Also, the HMI's Natural Navigation system always responds to verbal inquiries in natural, two-way conversations regarding driving routes, etc. without the need for pressing a button or trigger words.

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



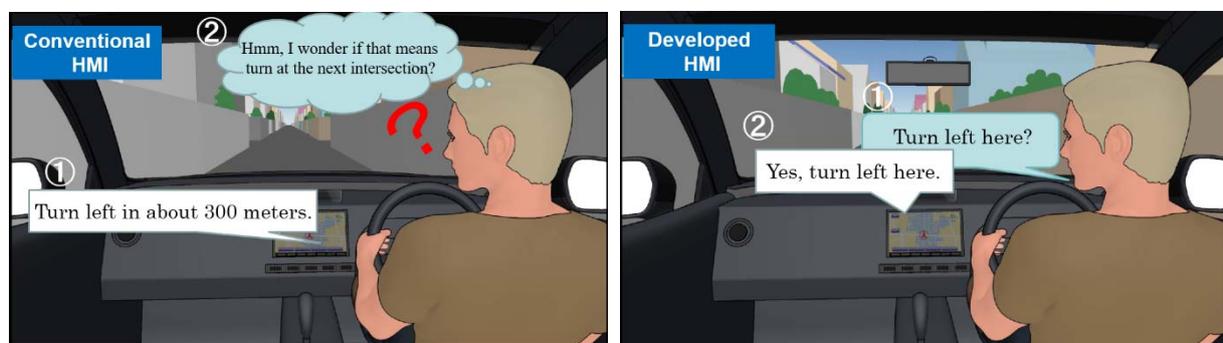
Example of smart notification

Increasingly common driver-assistance systems equipped with cameras and/or sensors are designed to detect objects more effectively than drivers. Also, voice-recognition technology is already being equipped in some car navigation systems. Conventional driver-assistance systems detect objects (cars, pedestrians, etc.) and then

notify the driver. Sometimes, however, drivers feel annoyed and ignore such notifications, and vague, one-sided notifications can result in drivers taking the wrong route. In response to these limitations, Mitsubishi Electric has now developed technologies for Smart Notifications and Natural Navigation, which are expected to contribute to safer and more convenient driving.

Smart Notifications combine Maisart image-recognition technology and information from on-board video cameras to recognize potentially hazardous objects, such as cars, humans and other moving objects, located outside of the driver's line of sight. The direction the driver is facing is recognized by a Driver Monitoring System (DMS), which monitors the driver with a camera, and compares the directions of moving objects and facial orientation to guess the driver's blind spots, based on which it provide alerts via displays and alarms. Tests conducted by Mitsubishi Electric demonstrated that the system is very effective in detecting objects and gaining the driver's attention.

Natural Navigation allows the driver to verbalize questions about routes in a conversation-like manner without having to push a button or trigger words.. The system detects when the driver's mouth is open and understands voice prompts by using the DMS and a microphone array (multiple microphones that synchronize recorded sound). Significantly, the system not only recognizes speech but also distinguishes between questions intended for the navigation system and unrelated conversation with other passengers. The driver can engage the system with conversation-like dialog to provide and receive information in a highly natural manner.



Comparison of conventional navigation system and newly developed HMI's "natural navigation"

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.

Patents

Pending patents for the technology announced in this news release number 12 in Japan and 12 outside of Japan.

Maisart is a registered trademark of Mitsubishi Electric Corporation.

###

About Mitsubishi Electric Corporation

With nearly 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. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology. The company recorded consolidated group sales of 4,444.4 billion yen (in accordance with IFRS; US\$ 41.9 billion*) in the fiscal year ended March 31, 2018. For more information visit:

www.MitsubishiElectric.com

*At an exchange rate of 106 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2018