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FOR IMMEDIATE RELEASE **No. 3848**

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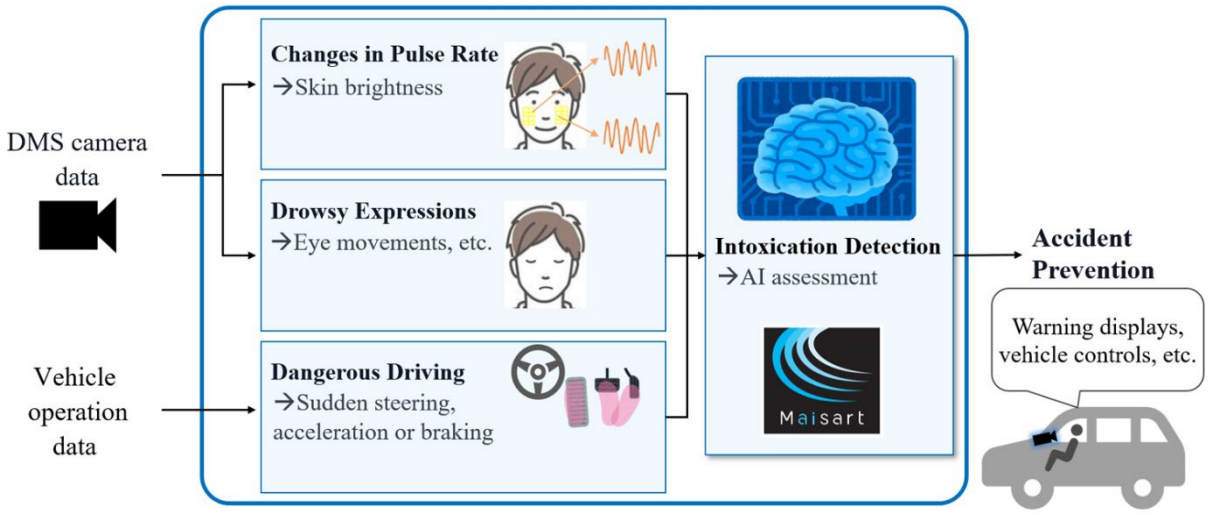
Mitsubishi Electric Technology Detects Intoxication During Driving to Provide Driver Alerts and Even Vehicle-control Interventions

Verified for compliance with European and U.S. regulatory and assessment frameworks, aiming to help reduce traffic accidents caused by drunk driving



Overview of intoxication-detection technology

TOKYO, December 16, 2025 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today that it has developed a technology[1] that accurately detects intoxication levels indicated by driver distraction and drowsiness, and provides driver alerts and vehicle-control interventions as needed to help prevent alcohol-related accidents. The system detects intoxication using a combination of non-contact pulse-rate measurements, which are based on images captured with a driver monitoring system (DMS), and vehicle control data, such as steering and acceleration inputs. Mitsubishi Electric hopes that its in-vehicle technology, which incorporates the company's proprietary Maisart®[2] AI technology, will reduce traffic accidents and fatalities due to drunk driving beginning possibly as early as next year.

The system's AI analyzes pulse-rate and eye-movement data extracted from DMS images and vehicle-control signals to determine intoxication. Even if alcohol-induced facial changes are subtle, variations in pulse rate

[1] Complies with Mitsubishi Electric's AI Ethics Policy.
[2] "Mitsubishi Electric's AI creates the State-of-the-ART in technology":
Mitsubishi Electric's AI technology brand aimed at making every device smarter.

caused by drinking can be used to detect intoxication with high accuracy. Mitsubishi Electric hopes that its new technology for high-precision detection of intoxication will reduce alcohol-related driving accidents and thereby contribute to a safer world.

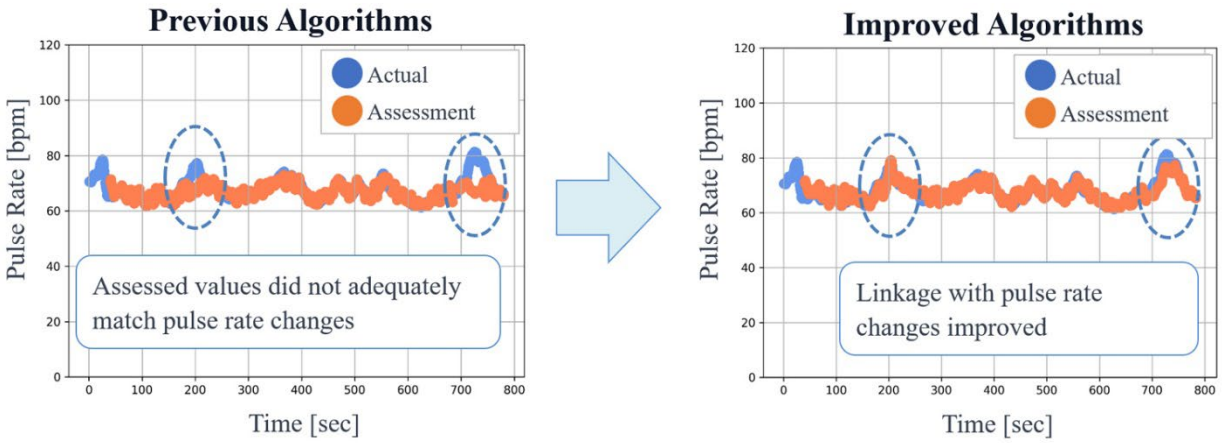
Features

1) High-precision pulse-rate measurement from near-infrared images captured by DMS

- Near-infrared cameras capture the driver's facial images and extract tiny luminance fluctuations in the skin caused by blood flow changes associated with pulse, enabling contactless pulse measurement.
- Improved algorithms suppress unrelated external data, such as vibrations, acceleration and illumination changes during driving, enhancing the system's ability to track pulse-rate variations caused by alcohol.
- The system can be added to a vehicle's electronic control unit (ECU)[3] via a software update.

2) High-precision detection using biometric data robust to external conditions

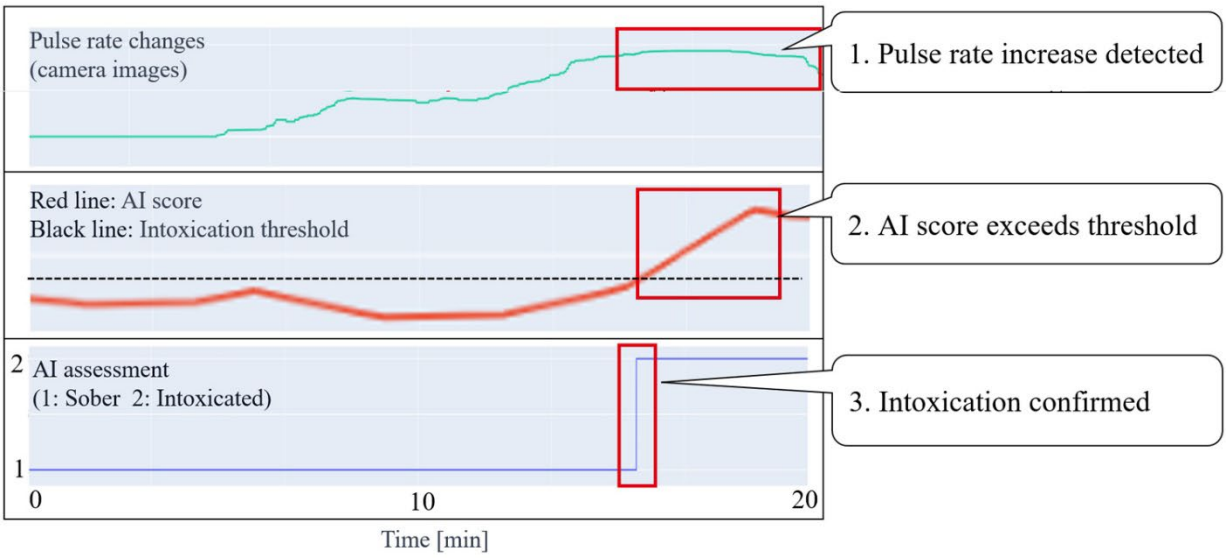
- The AI system determines intoxication by analyzing pulse-rate data, eye movement data obtained from DMS images, and vehicle-control information. Pulse-rate data enables accurate detection of decreased alertness, even when changes in alcohol-induced facial expressions are subtle.
- In joint research with Oakland University in Rochester, Michigan, United States, data on various skin types, ages, genders and races[4] was incorporated into the system and verified for compliance with European and U.S. regulations.
- Warning displays and vehicle controls are implemented if intoxication is detected, helping to reduce the risk of accidents due to drunk driving.



New algorithms more responsive to heart rate changes

[3] Verification was performed on an ECU equipped with the Renesas R-Car E3e.

[4] During tests (September 2024–July 2025), safety-related data was collected from approximately about 100 intoxicated drivers.



Mechanism for detecting driver intoxication based on increased pulse rate

Drunk driving is a serious worldwide problem, accounting annually for over 10,000 fatalities in the U.S. and more than 2,000 in 23 EU countries.[5] While alcohol-related driving incidents are decreasing in Japan due to stricter penalties and administrative measures, serious accidents still occur. Europe is considering equipping DMS with intoxication-detection capabilities under its New Car Assessment Program,[6] and discussions are underway in the U.S. to mandate drunk-driving prevention technologies in new vehicles. Some countries have introduced alcohol interlock systems,[7] but they cannot detect drinking after ignition. Similarly, camera-based technologies that assess driver alertness using facial and eye data are limited because alcohol-induced changes in alertness vary greatly among individuals, making accurate detection difficult using facial expressions alone.

Future Development

Mitsubishi Electric will continue to improve and evaluate its technology in line with regulatory and detection frameworks in Europe and the U.S., aiming at commercial introduction by 2026 or later.

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About Mitsubishi Electric Corporation

With more than 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 5,521.7 billion yen (U.S.$ 36.8 billion*) in the fiscal year ended March 31, 2025. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥150=U.S.$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2025

[5] Drunk Driving | Statistics and Resources | NHTSA, ETSC-SMART-Report-2022-V6-1.pdf

[6] An evaluation conducted by public agencies in various countries to objectively assess vehicle safety performance, providing consumers with safety information when purchasing vehicles.

[7] A device that measures the driver's breath alcohol concentration before starting the engine and prevents ignition if the alcohol level exceeds the threshold.