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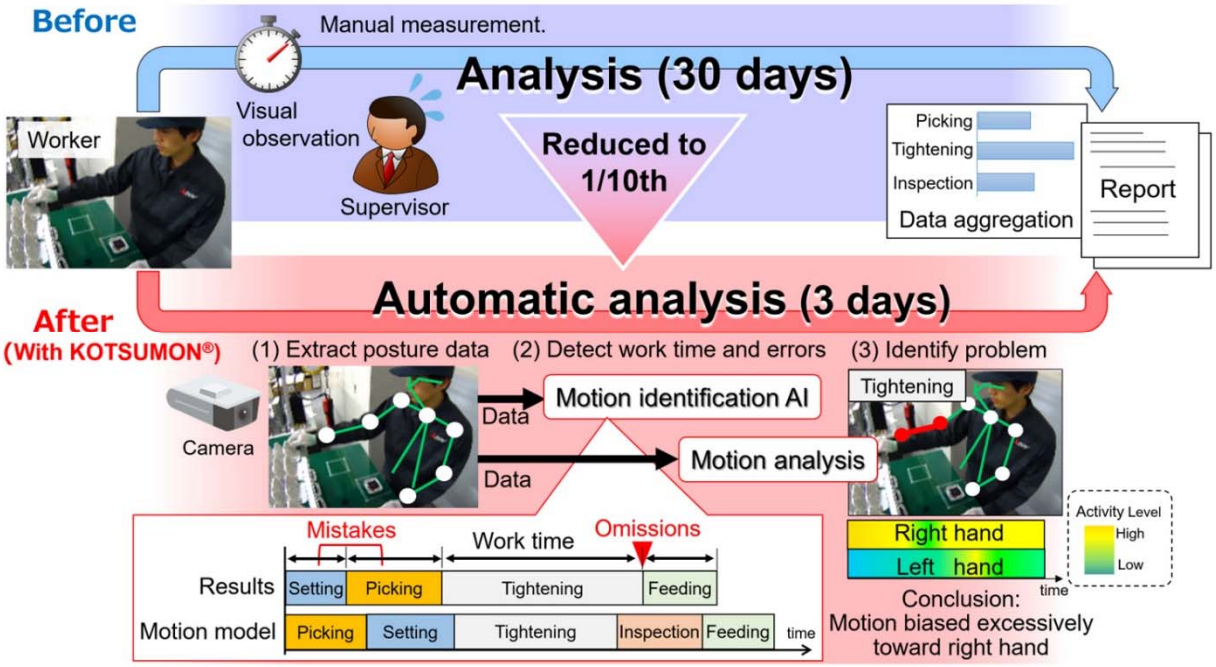
Mitsubishi Electric's KOTSUMON® System Uses AI Video Technology to Analyze Production Line Workers' Motions

TOKYO, October 9, 2019 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today its newly developed KOTSUMON® system uses the company's Maisart®* artificial-intelligence (AI) technologies to extract video data for the automatic identification and analysis of specific types of human motions, such as those of workers on production lines. The system simply requires a normal video to automatically measure work efficiency and detect omitted or mistaken motions, which manufacturers are expected to use to upgrade their line operations for improved productivity.

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



Enhancing the efficiency of operations analysis by adopting KOTSUMON

Key Features

1) Measures work time and detects mistaken motions to reduce analysis time to one-tenth normal

Mitsubishi Electric's new system automatically identifies motions with 90 percent accuracy** by using AI to learn a worker's poses and motions. Since the analysis can be performed with normal videos, there is no need to attach sensors to the worker, etc. Moreover, the analytical workload and time is just one-tenth** that of visual observation performed manually by supervisors. The technology was developed in collaboration with Professor Aoki Yoshimitsu and Aoki Media Sensing Laboratory of Department of Electrical Engineering, Faculty of Science and Technology, Keio University.

** Based on in-house analysis

2) Motion extraction and visualization enables standardized analysis by any supervisor

Correcting a line worker's motions is generally a three-step process: firstly, detect inappropriate or useless motions; secondly, determine needed corrections in physical processes and/or working environment; and thirdly, teach the worker more efficient motions. Often, however, workers move too fast to detect problems visually, and analytical results can vary from one supervisor to the next, making it difficult to obtain consistently useful results through manual analysis.

Mitsubishi Electric's new system, which is based on the principles of motion economy,*** can extract a worker's motion data from a video to automatically detect incorrect movements. Even problems not detectable manually can be identified automatically to ensure consistent, standardized results regardless of the supervisor in charge.

*** An empirical rule comprising about 30 items, proposed by motion-research pioneer Frank Gilbreth, minimizing human fatigue, increasing work effectiveness and utilizing human energy efficiently.

Future developments

Mitsubishi Electric will conduct verification tests on company production lines to develop the system for practical use, aiming at commercial releases in factory monitoring systems and motion-analysis software in the fiscal year ending in March 2021 or thereafter.

Background

According to a report issued by Japan Robot Association number of industrial robots introduced in Japan's manufacturing sector in 2017 totaled only 308 units per 10,000 workers. Manual procedures still constitute core processes on many production lines, so improving the procedures remains a key to enhancing manufacturing productivity. Currently, supervisors monitor their line workers through visual observation and measure work time and operational errors manually, an enormous workload that can make it nearly impossible to perform visual observations on a regular basis.

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 and KOTSUMON are registered trademark of Mitsubishi Electric Corporation.

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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 a revenue of 4,519.9 billion yen (US$ 40.7 billion*) in the fiscal year ended March 31, 2019. For more information visit:
www.MitsubishiElectric.com

*At an exchange rate of 111 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2019