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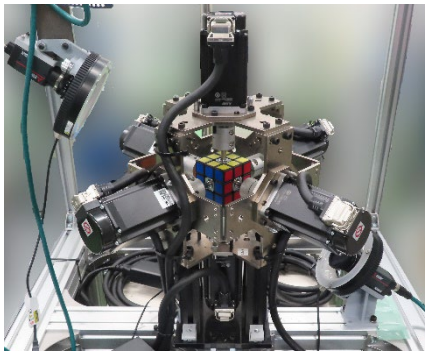
Mitsubishi Electric Recognized by GUINNESS WORLD RECORDS for the fastest robot to solve a puzzle cube

Record achieved with high-speed, high-precision FA equipment and control technology

The project team with the GUINNESS WORLD RECORDS certificate in Hyogo, Japan



TOKUFASTbot solving a puzzle cube (video)

TOKYO, May 23, 2024 – Mitsubishi Electric Corporation (TOKYO: 6503) announced today that it has been awarded the GUINNESS WORLD RECORDS™ title for the fastest robot to solve a puzzle cube using a robot equipped with high-speed, high-precision factory automation (FA) equipment and control technology. The robot's time of 0.305 second beat the previous record of 0.38 second, for which Mitsubishi Electric received a GUINNESS WORLD RECORDS certificate on May 21.

The TOKUI Fast Accurate Synchronized motion Testing Robot (TOKUFASTbot) named by its engineer can perform a 90º rotation time of 0.009 second thanks to its rotation mechanism, which is built with Mitsubishi Electric's compact, high-power, signal-responsive servomotors and a color-recognition algorithm developed with proprietary AI technology. In addition, the servomotors, programmable controller, industrial PC, touch panel display and cameras are all designed to achieve high-speed signal connection and inter-device control.

A video showing the robot solving a puzzle cube taken on May 7 is available on Mitsubishi Electric - Global channel.

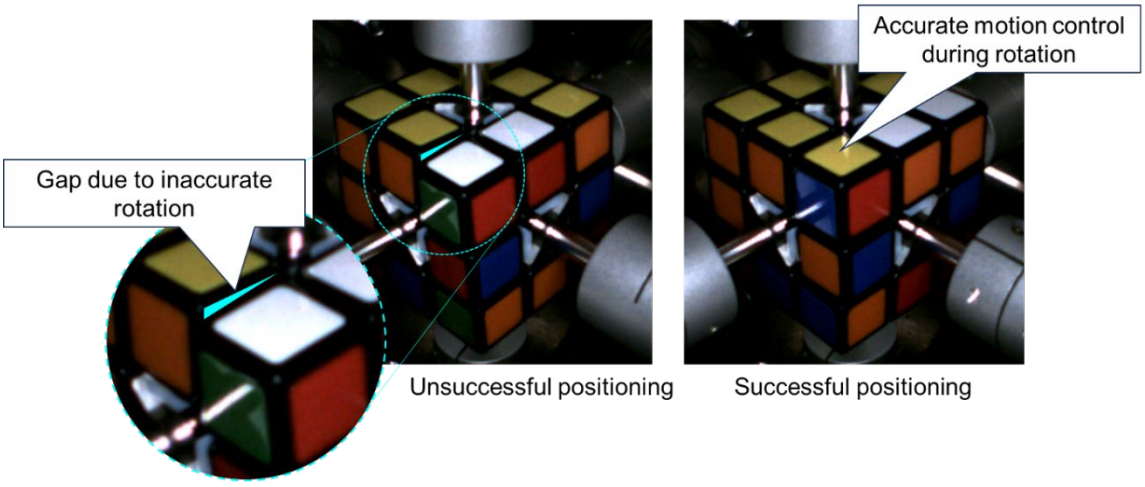
Yuji Yoshimura, Senior General Manager, Component Production Engineering Center, Mitsubishi Electric said, "Since establishing our Component Production Engineering Center in 2016, we have been developing and manufacturing high-tech motors, power semiconductors and related products. To demonstrate our technical

capabilities in achieving high-speed, high-precision windings, which are key to increasing the productivity and efficiency of motors used in many of our products, our young engineers voluntarily worked to set the world record, resulting in a GUINNESS WORLD RECORDS title, which has motivated our engineers to further develop their technical skills. We will continue to take on exciting challenges using the technology we have cultivated in motor development to support global manufacturing."

Features of Related Technology

1) Proprietary high-speed, high-precision positioning technology

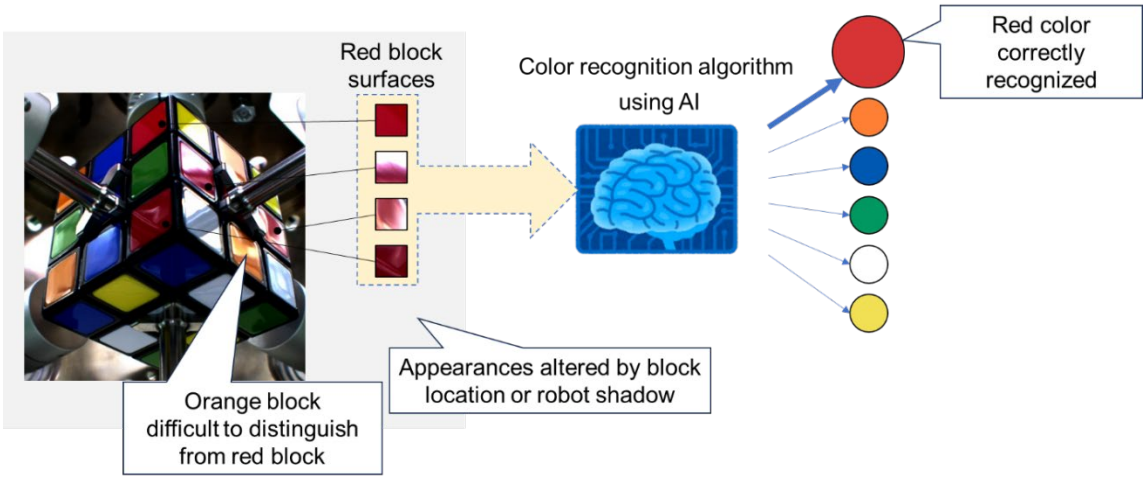
- Mitsubishi Electric's motion-control technology, which is used in the manufacturing process of the motors in diverse fields from consumer products to railways to quickly and accurately position electric wires in winding equipment used to manufacture motor coils, was incorporated into the record-breaking robot.



Advanced positioning technology

2) AI-based color-recognition algorithm achieves instant color identification

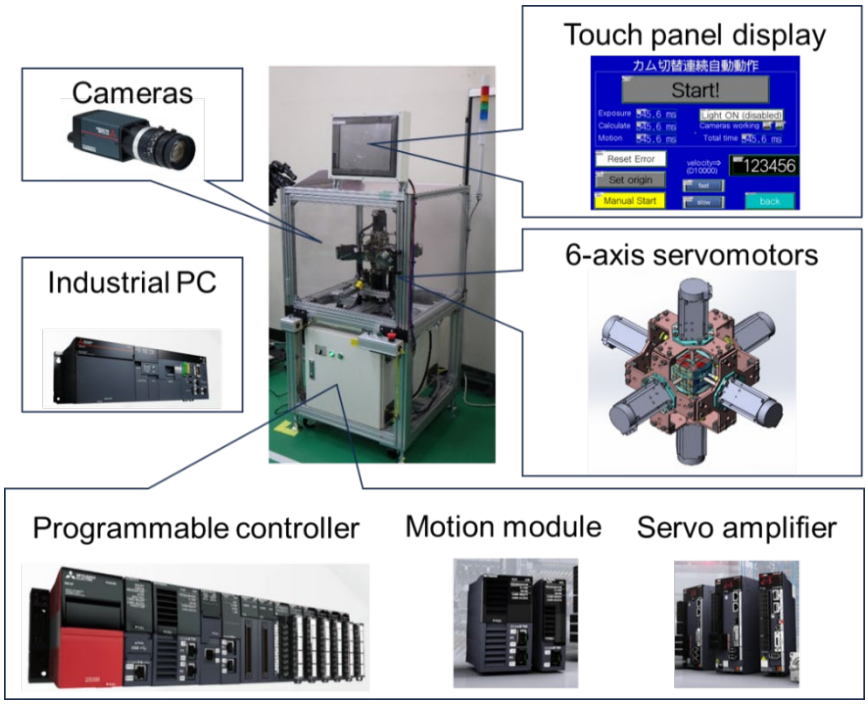
- The algorithm using proprietary AI achieves accurate color correction and color recognition even when appearances differ due to block positions or the shadow of the robot hand. It also enables automatic recognition and identification of red and orange blocks, which are particularly difficult to distinguish due to their similar hue.
- The program that analyzes the rotation procedure to match block colors in the shortest number of moves has been optimized to accelerate and enhance computational processing, resulting in a world record.



Advanced color identification

3) Mitsubishi Electric FA products used to achieve high-speed signal connection and control

- A 90º rotation time of 0.009 second is achieved by using the company's compact, high-power and signal-responsive servomotors in the rotation mechanism.
- In addition, the company's advanced programmable controllers, industrial PCs, touch panel display, cameras and other devices are used for the robot's main equipment, enabling the devices to collectively achieve high-speed signal connection and control.



Mitsubishi Electric FA equipment used for robot mechanism

Future Developments

Going forward, Mitsubishi Electric will continue to pursue innovative manufacturing by improving the efficiency and performance of its products to deliver greater value to customers and contribute to carbon neutrality by providing manufacturing equipment products and services that achieve superior productivity and energy savings.

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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 5,257.9 billion yen (U.S.$ 34.8 billion*) in the fiscal year ended March 31, 2024. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥151=U.S.$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2024