AI improves maintenance management for robots

As Industry 4.0 turns into a reality, businesses that are introducing more robots into the production environment will be able to benefit from increasingly efficient maintenance regimes. As with any asset, these critical machines will run at peak efficiency when operators have access to predictive maintenance tools. The latest predictive analytics solution supplied with Mitsubishi Electric industrial robots uses Artificial Intelligence (AI) as a key feature for optimisation.

Barry Weller, Product Manager at Mitsubishi Electric, looks at how AI-based predictive analytics can support robot predictive maintenance and how this can benefit end users.

Both standard industrial and collaborative robots can create new opportunities for streamlining production and assembly operations. Yet, just like any other machines, robots require maintenance support in order to deliver optimal performance.

Predictive maintenance feeds on good data

To forecast when a piece of equipment is likely to fail, predictive maintenance algorithms process and analyse data collected from different sources to build a model that can deliver useful actionable insight on the status of a robot.

AI systems are the most useful tools to recognise patterns, make predictions and give practical advice on actions to take. By using a suite of technologies, AI shows an unmatched ability to process large volumes of data in order to identify patterns within the data and generate predictive models.

These can help to accurately calculate wear and consumption for different robot components or identify trends suggesting a component is about to fail. Examples of relevant information that AI-based predictive maintenance can use includes machine operating conditions, components' average service lives, frequency of specific robot motion patterns or real-time data from the drives.

The raw data results obtained may be clear to the AI system, with its ability to crunch the numbers, however they may not be straightforward for humans to interpret. Therefore, visualisation is a key aspect of AI-based predictive maintenance, as it presents the information generated by the model in an accessible and immediate way to plant and maintenance operators.

This leads to knowledge that informs meaningful decisions and quick actions, without the need for specialised skills or training in data mining. A direct result of this are efficient maintenance schedules that maximise equipment use or intervene before breakdowns occur.

Make the step towards maintenance 4.0

Those using Mitsubishi Electric industrial robots now have direct access to that type of solution as the AI functionalities are embedded in the company's latest MELFA SmartPlus software for its FR-series intelligent robots. The system is built-in to the robot controller and offers three main functions.

Consumption degree calculation determines when robotic parts, such as ball screws and ball splines, gears, bearings and belts are likely to need replacement. Whenever maintenance is required, the system can send clear notifications.

The second function offers maintenance simulations. By combining the same data used by the consumption degree model, the AI system can estimate the robot service life and offer a maintenance schedule that optimises maintenance costs and takes into account the operating conditions and activities performed by the robot.

Thanks to this function, end users can understand, schedule and optimise robot maintenance even before installing the machine on the factory floor. This provides them with the confidence that their robot investment is worthwhile.

Finally, the AI system offers a centralised robot management platform. The data from SmartPlus can be loaded onto multiple cloud-based analytics solutions and will interact with upper-level enterprise systems to combine their data with maintenance data from the robot controller. In this way, the solution can deliver highly reliable predictive models.

Sometimes it is easy to forget that Industry 4.0 and Big Data do not only mean intensifying processes but also supporting maintenance activities. By applying AI-based predictive maintenance to their robots, industries can fully maximise the efficiency and productivity of their automated systems.

Image captions:

Image 1: SmartPlus can estimate the robot service life and offer a maintenance schedule that optimises maintenance costs and takes into account the operating conditions and activities performed by the robot.
[Source: Mitsubishi Electric Europe B.V.]

Image 2: Predictive maintenance models can help to accurately calculate wear and consumption for different robot components or identify trends suggesting a component is about to fail.
[Source: Mitsubishi Electric Europe B.V.]

Image 3: Examples of relevant information that AI-based predictive maintenance can use includes machine operating conditions, components' average service lives, frequency of specific robot motion patterns or real-time data from the drives.
[Source: Mitsubishi Electric Europe B.V.]

The image(s) distributed with this press release are for Editorial use only and are subject to copyright. The image(s) may only be used to accompany the press release mentioned here, no other use is permitted.

All third party trademarks and/or registered trademarks are the property of their respective owners and are acknowledged.

Note to Editor: if you would like the text in another language please contact Carolin Heel at DMA Europa – carolin@dmaeuropa.com.

About Mitsubishi Electric

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 approximately 40.7 billion dollars* in the fiscal year that ended on March 31, 2019.

Mitsubishi Electric Europe, Industrial Automation – UK Branch is located in Hatfield, United Kingdom. It is a part of the European Factory Automation Business Group based in Ratingen, Germany which in turn is part of Mitsubishi Electric Europe B.V., a wholly owned subsidiary of Mitsubishi Electric Corporation, Japan.

The role of Industrial Automation – UK Branch is to manage sales, service and support across its network of local branches and distributors throughout the United Kingdom.

At an exchange rate of 111 Yen = 1 US Dollars, last updated 31.03.2019 (Source: Tokyo Foreign Exchange Market)

Further Information:
Website: gb3a.mitsubishielectric.com

Email: automation@meuk.mee.com

Facebook: www.facebook.com/MEUKAutomation

Twitter: twitter.com/MEUKAutomation

YouTube: www.youtube.com/user/MitsubishiFAEU

LinkedIn: www.linkedin.com Mitsubishi Electric - Automation Systems UK

Editor Contact

DMA Europa Ltd. : Carolin Heel

Tel: +44 (0)1562 751436
Web: www.dmaeuropa.com
Email: carolin@dmaeuropa.com

Company Contact

Mitsubishi Electric Europe B.V. Automation Systems Division : Garry Lewis, Manager - Marketing & Communications

Tel: +44 (0) 1707 288769
Fax: +44 (0) 1707 278695
Web: gb3a.mitsubishielectric.com
Email: automation@meuk.mee.com