MITSUBISHI ELECTRIC
Changes for the Better

for a greener tomorrow eco Changes

AI applied to Robots

Realizing manufacturing that is a step ahead of the times

INTRODUCTION

Mitsubishi Electric:

Changes for the Better

- Integrated electrical/electronics supplier
- Established 1921,
- 4,431.2 billion Yen consolidated net sales
  (for the year ending March 31st 2018)

Hajime Sugiyama

- Mitsubishi Electric Head Quarters (Tokyo)
- Industrial IoT Evangelist
- Lead Global e-F@ctory Alliance coordinator

Background

- Nagoya Factory PLC Production Planning
- Project Leader for Greenfield Automotive Powertrain Installation in USA
- Member of e-F@ctory startup team (2003)
- 6 years in Europe (EMEA Executive VP for Factory Automation BU)

Mass customization

Time to market

Cost reduction

Are Robots the answer?

It's **not** as **easy** as you think

Manufacturing

“Time is **money**”

“Every millisecond **counts**”

The **Perfect** AI

Don’t think about using AI.

Think about using **smart** products!

Enhanced performance

Vision

Predictive Maintenance

Force feedback

Optional Path Calculation

Reporting

Start

Stop

Maintenance

STOP!

Enhanced Human Interaction

Robot AI in

ACTION

Example: Bearing insertion

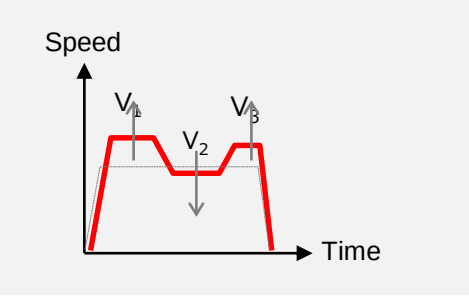
Conventional Speed control

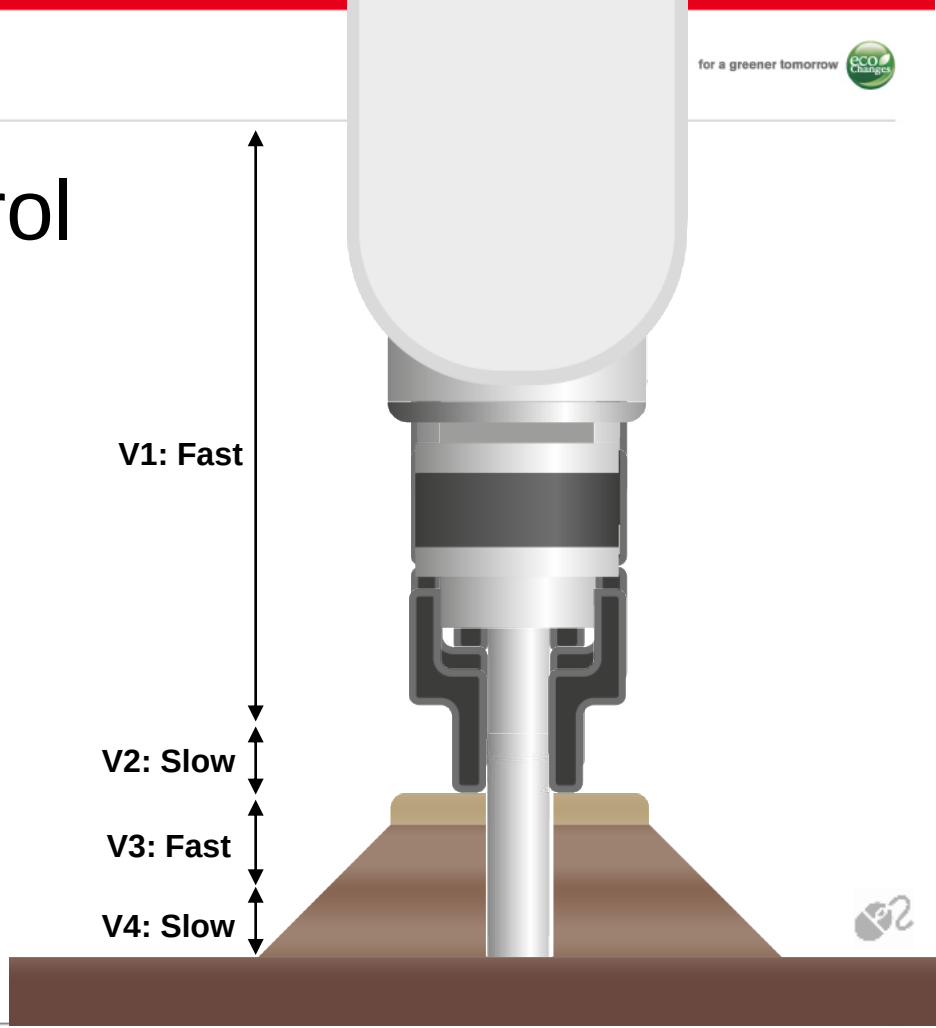
Optimized Speed control

AI

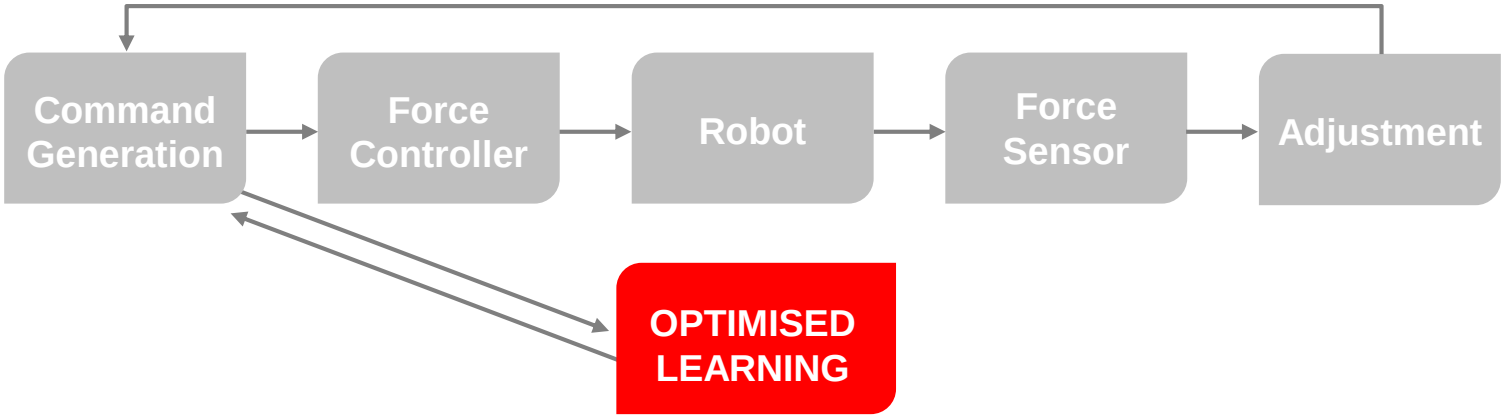
+

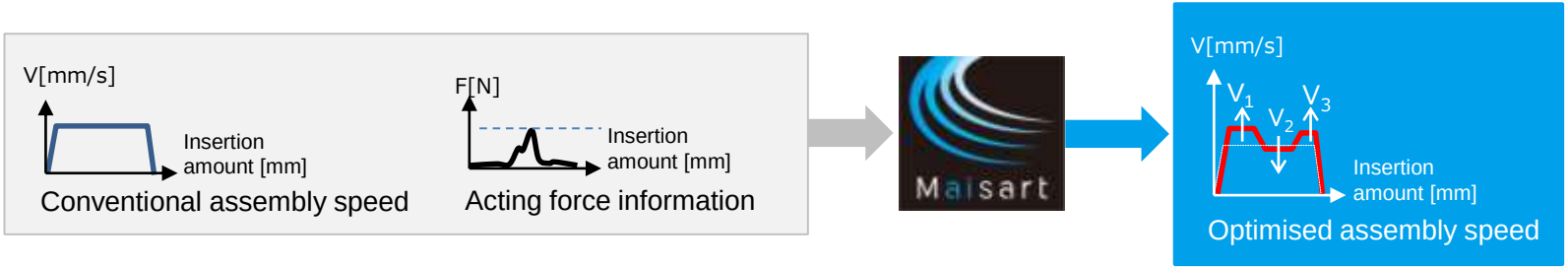
Force Sensor



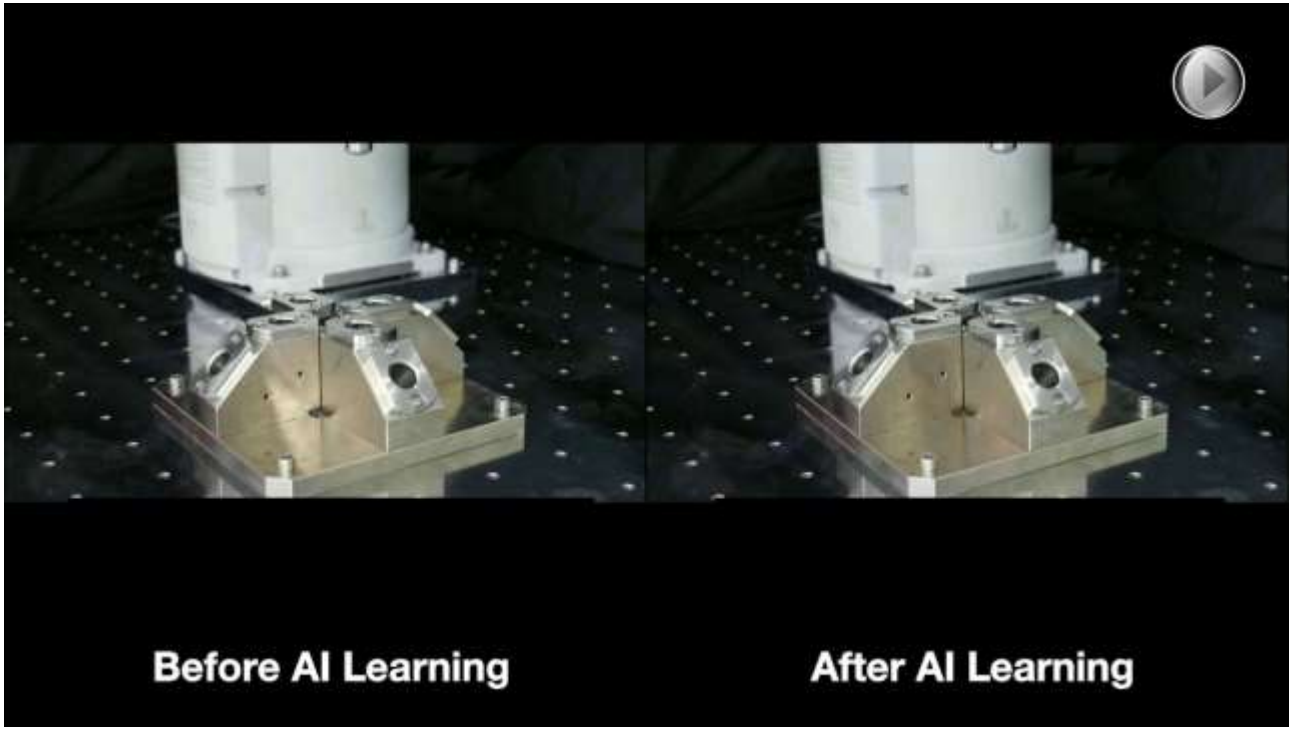


AI can **help** you





Example: Bearing insertion



Reduced setup times

*Experimental value

The **future** awaits

Aren't these **cool?**

No **Jigs** necessary

Free movement

Lean & **flexible**

The future is closer than you think

AI in

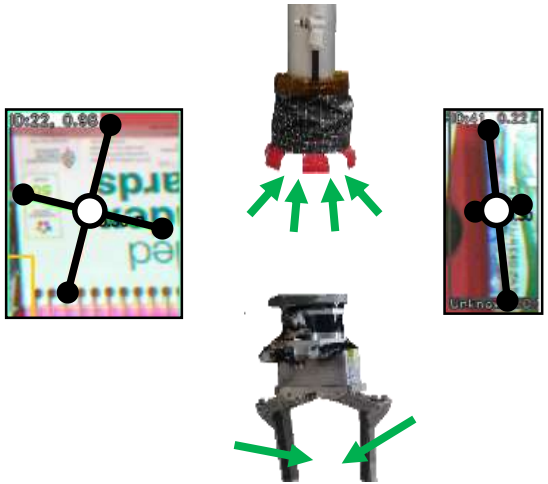
ACTION

APPLIED AI

Automatic picking in logistics center

Automatic picking in logistics center

- Real-time recognition of product type and position
- Comparison with basic models (flat, cube, sphere) to decide on stable holding point
- Select appropriate hand/suction



Real-time recognition

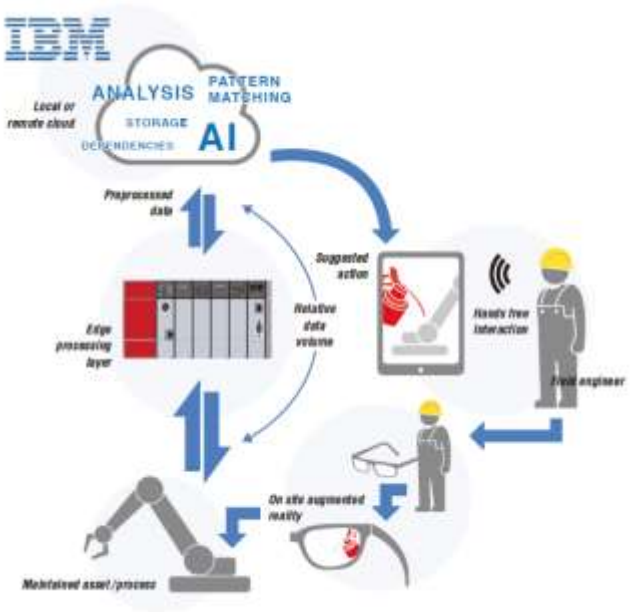
Amazon Robotics Challenge Demo(x16 Speed)

Amazon Robotics Challenge: Competition held by Amazon regarding Automation Technology in Logistics Fields

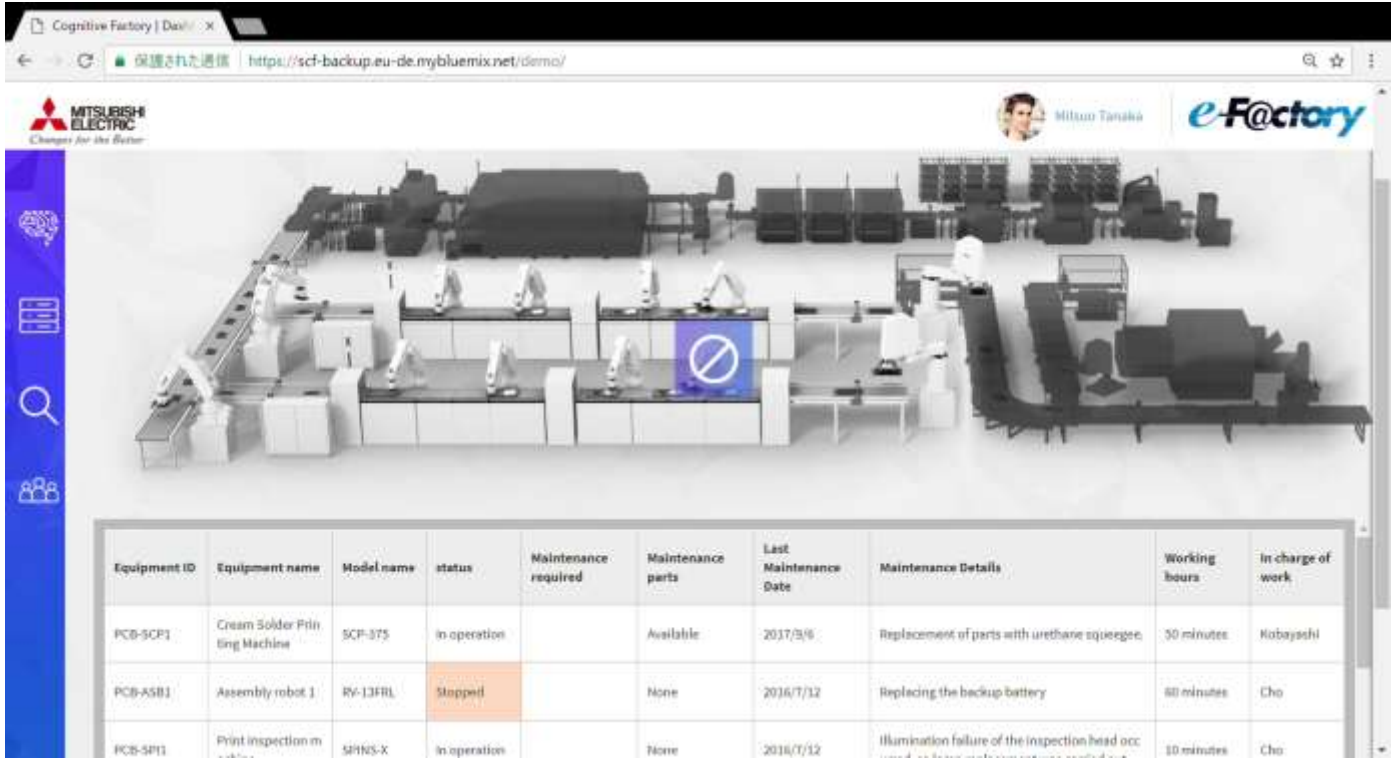
APPLIED AI

Preventive maintenance

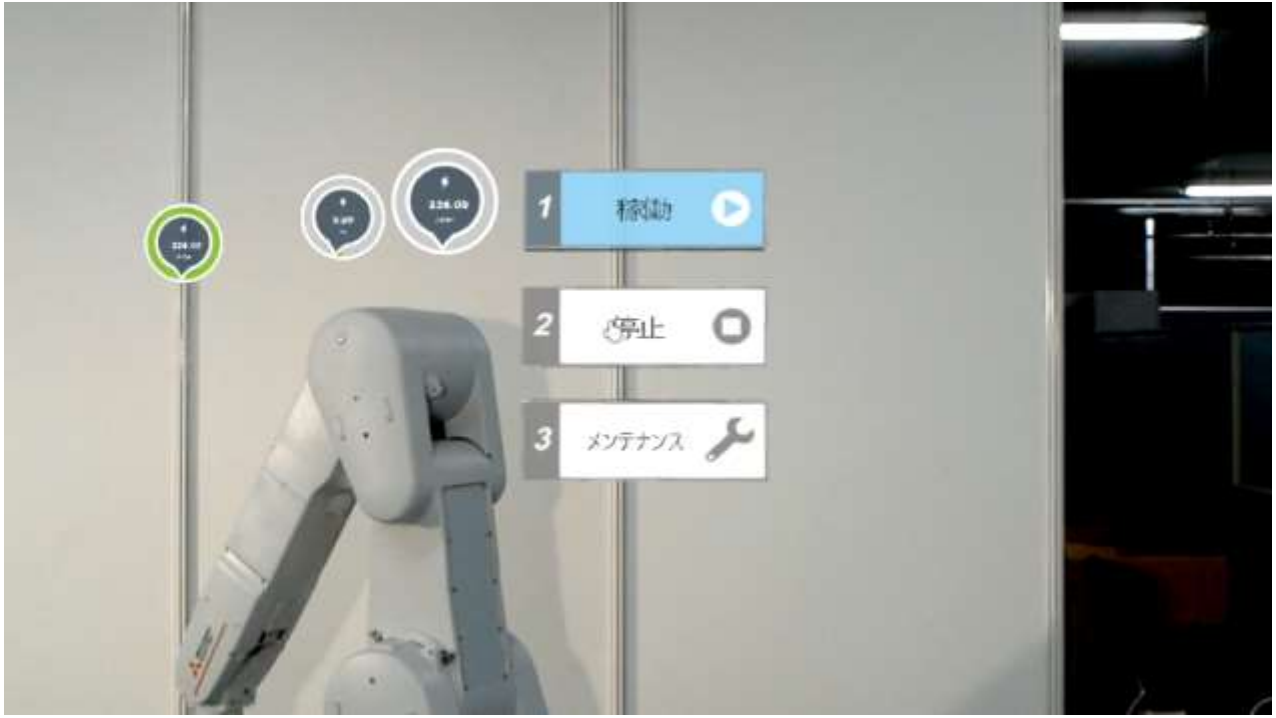
- Monitoring and prediction of failure
- Automatic suggestion of
  - maintenance
  - necessary tools
- Link with purchasing systems for delivery
- Voice recognition and AR for hands free interaction



Interacting with AI



Maintenance with Augmented Reality Glasses



Robotics and AI

…time is money

…enhancing of robots and humans

…installed on the edge

…and invisible

Make everything smart

Meet us at Hall **17** Stand **D26**

Legal Disclaimer (must not be removed)

The contents of this document are provided as illustrative subject matter. No license, expressly or implied to any intellectual property rights is granted by this document. With regard to the products and services of Mitsubishi Electric referred to within this document, Mitsubishi Electric and its group companies assume no liability whatsoever and disclaim any express or implied warranty, relating to the use and/or sale of those products and services including liability or warranties relating to fitness for purpose, or infringement of any intellectual property right such as, but not limited to, patents, copyrights etc. except as provided by Mitsubishi Electric's terms and conditions of sale for those products and services.

All dates, figures, product specifications, service data, are based on Mitsubishi Electric's current understanding and are subject to change without notice.

Due to copyright controls around the images used in this presentation on no account may any of the images be copied, extracted, edited or otherwise reused and disseminated separately. If you have any questions regarding this please contact Mitsubishi Electric Corporation, 2-7-3 Marunouchi, Chiyoda-Ku, Tokyo, Factory Automation Systems Group, Overseas Marketing Division, Promotion Group Manager.

Where forward looking statements and proposals are provided these are based on Mitsubishi Electric's current expectations and are subject to risks and uncertainties that affect their validity, for example , but not limited to;

- the availability of information disclosed to Mitsubishi Electric
- changes in the state of the general business and economic environment
- effects triggered by changes in currency exchange rates and interest rates
- the development and adoption of new technologies
- the introduction and acceptance of new products and services

Other customers of Mitsubishi Electric may be listed within this documentation as illustrative examples, Mitsubishi Electric does not make any representations or endorsements of the products or services of those customers.

Mitsubishi Electric believe that an intrinsic part of building automation solutions is the ability to work with partners and third party company products, however, where such companies, their products and or services are referred to, Mitsubishi Electric does so in good faith but expressly does not make representations or warranties regarding their quality, reliability, functionality, compatibility or general suitability.

Such references to third party companies, products and services may change without notice.

Other names, trademarks, brands may be claimed as the property of others and as such are acknowledged.

Mitsubishi Electric, e-F@ctory, MELSEC, MELSERVO, FREQROL, MELFA, iQ Platform and their associated logo's are trademarks of Mitsubishi Electric Corporation in Japan and/or other countries.

It is not allowed to delete this disclaimer from the slide deck – the slide deck will be accompanied by an a original version in PDF format for reference.