

SELF-ADAPTIVE PRODUCTION IN HIGH VOLUME OPTICAL ASSEMBLY



HIGH VOLUME OPTICAL ASSEMBLY: A CHANCE FOR ML!

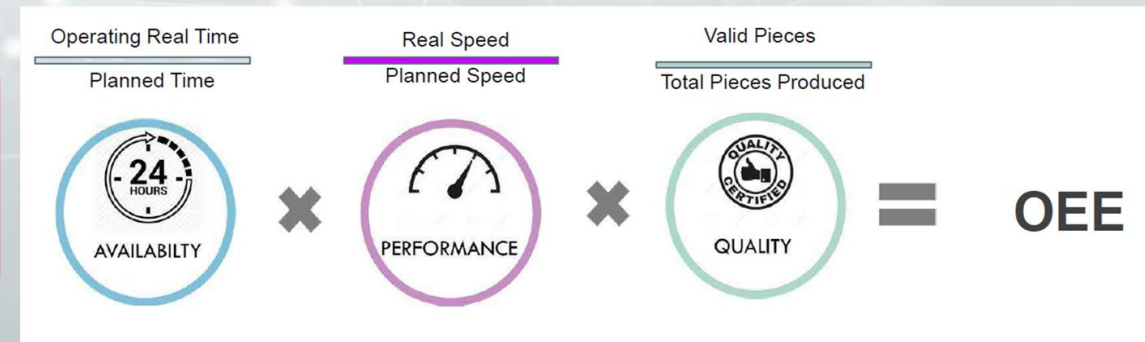
Conditions in Production:

- High OEE (Overall Equipment Effectiveness) requirements
- Fast & frequent product ramp-ups
- Complex production processes
 - Interdependence of parameters
 - Abundance of data



Machine Learning* can provide automated solutions to your production needs

*data driven model calculation



MACHINE LEARNING IN OPTICS ASSEMBLY: CHALLENGES

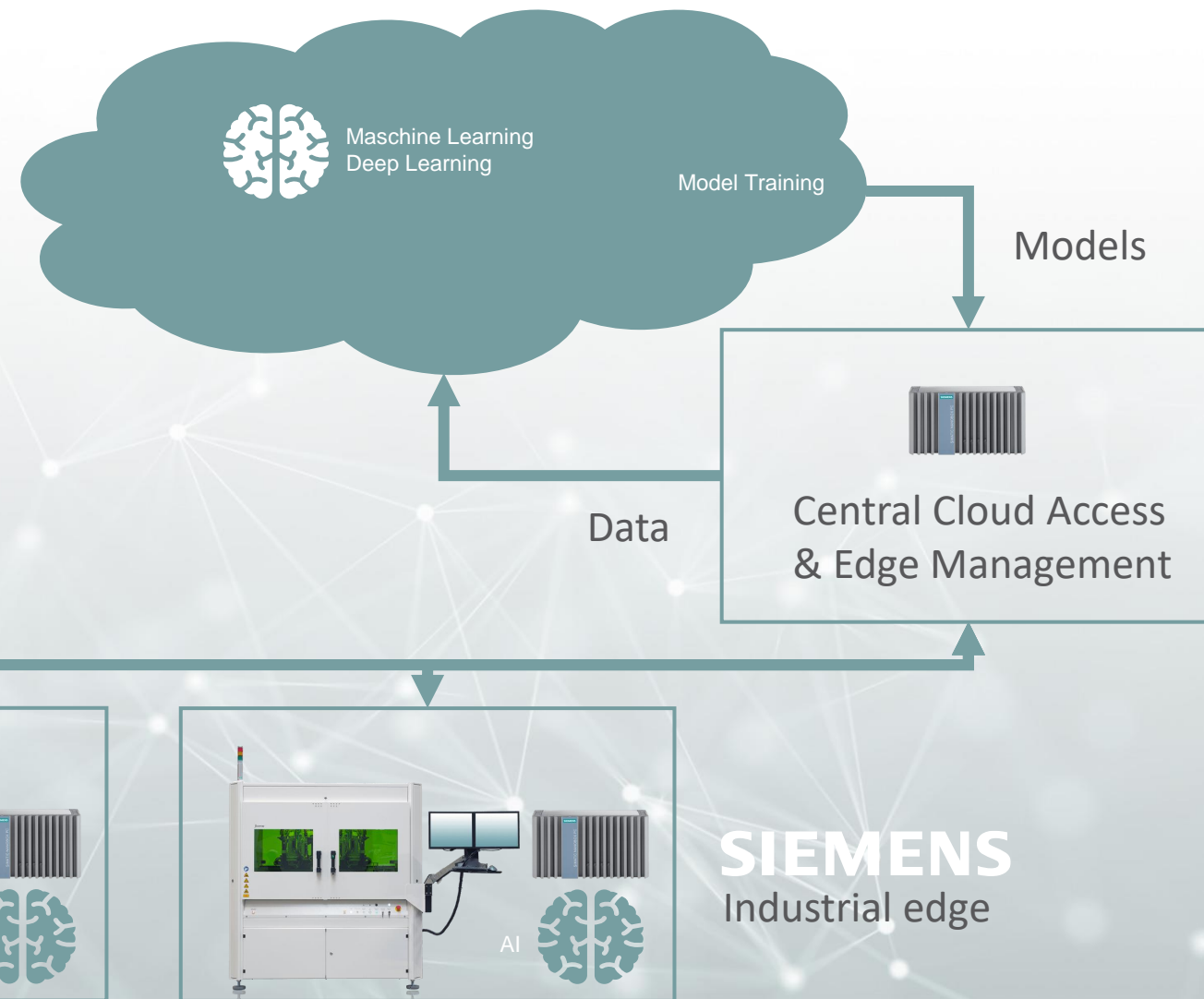
- Short product life cycle
 - Low model life time
- Lack of unified standards for packaging
 - Model transfer constrained
- Global value chains
 - No data scientists available on the factory floor

How to make Machine Learning field-proof?

Our answer:
robust infrastructure, self-adaptive production & self-learning models

INFRASTRUCTURE: EDGE, CLOUD & MACHINE

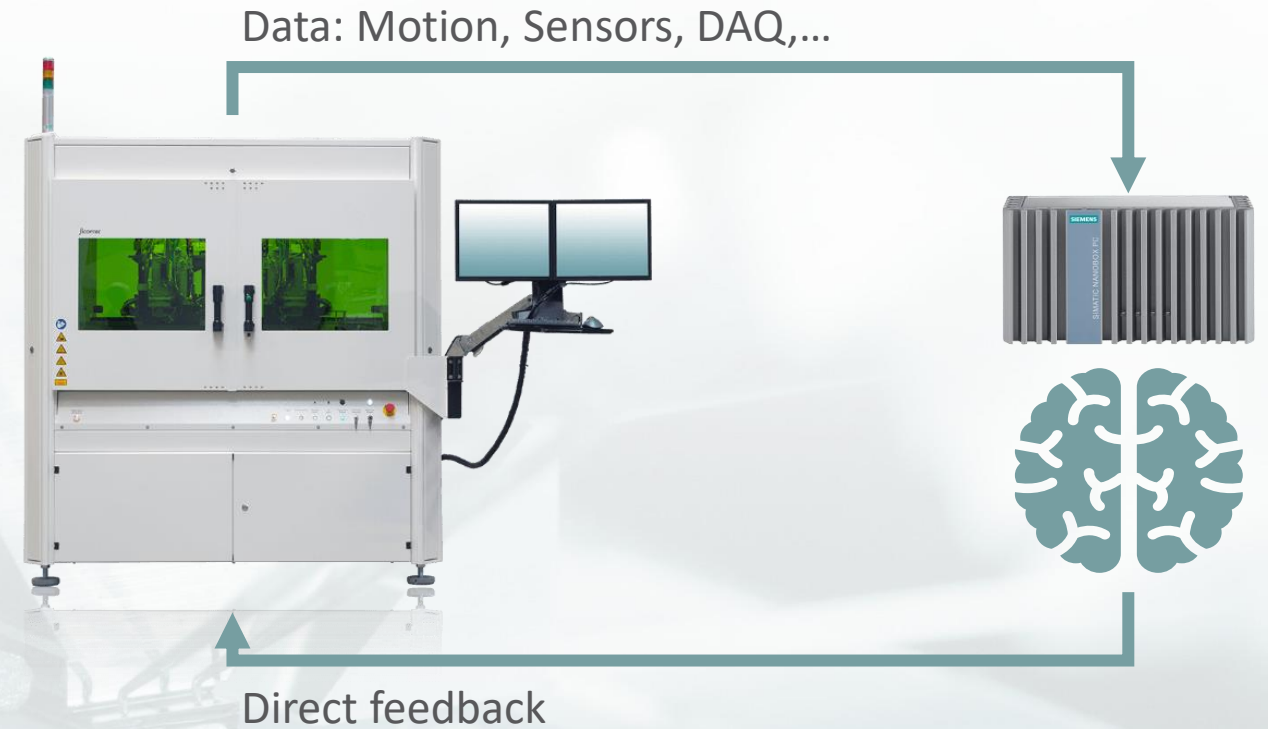
- **Edge** computation: **fast** response times
- **Cloud** model training: **effective** models by improved data handling
- **Machine** integration: **easy** implementation directly in process
- **Siemens** infrastructure: **secure** connections



SELF-ADAPTIVE PRODUCTION

Machine Performance improvement by direct feedback to machine

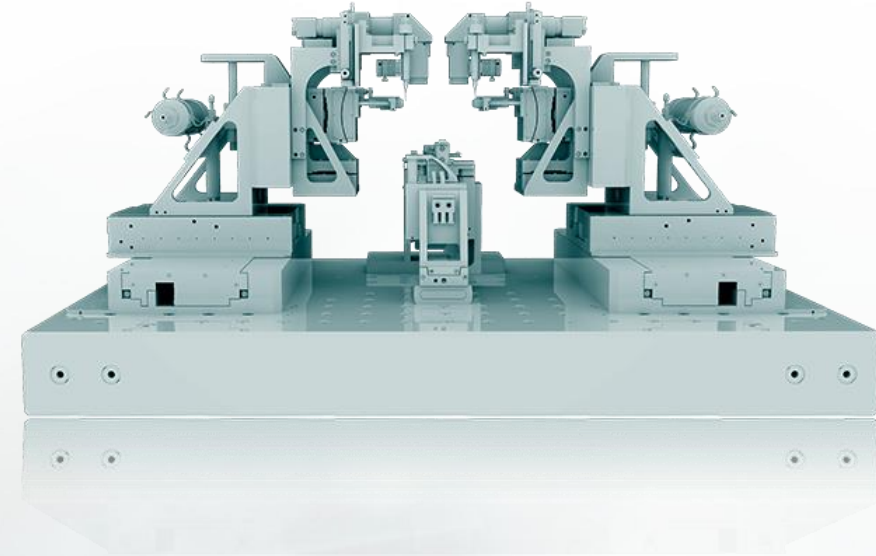
- Machine parameters adapt automatically to changing conditions
- Direct feedback - no human interaction
- Complete automation



ADAPTIVE MOTION

Optimum motion is a trade off:

- High throughput
 - fast motions
- High yield
 - accurate motions
 - Early alerting to prevent part loss
- Field conditions
 - Performance degradation over time



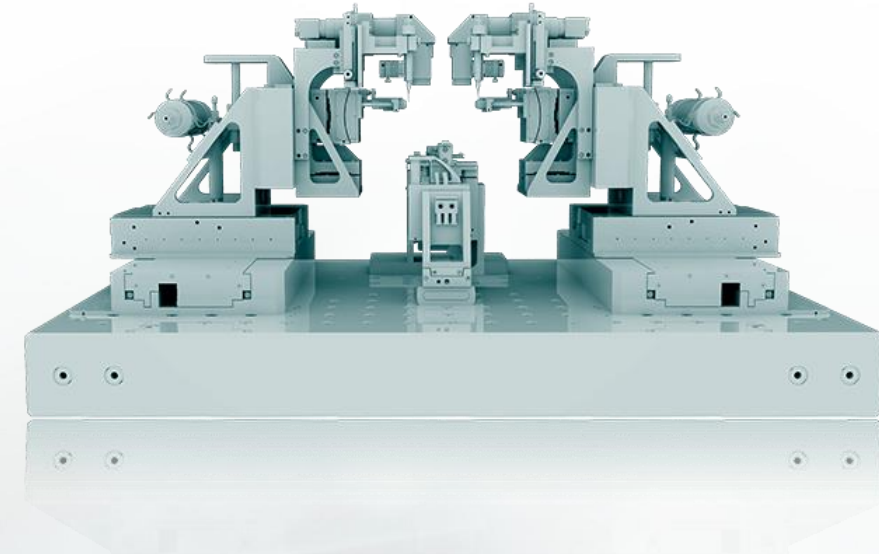
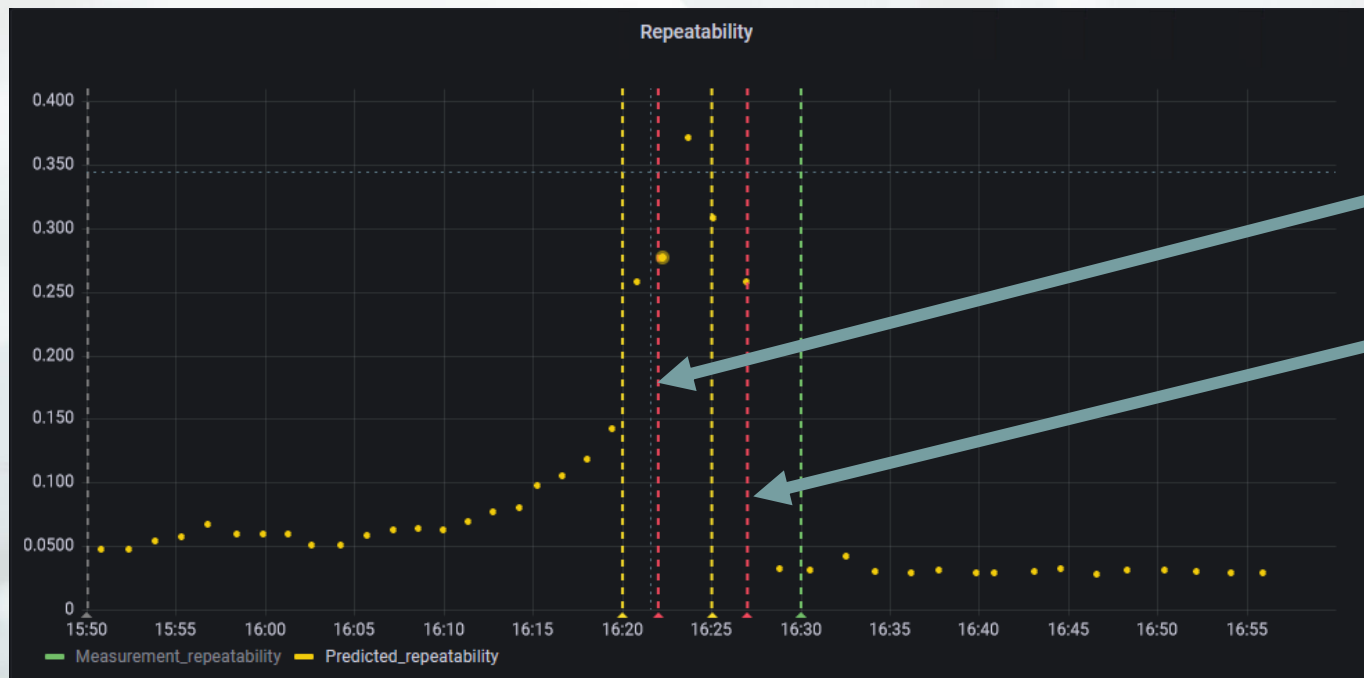
Ideally motion accuracy could be measured in the field

Measurement is not feasible without
sacrificing throughput

OUR SOLUTION: ADAPTIVE MOTION

Finding optimum balance between precision & speed

- In real time & during production
- No measurement required in production
- Flexible configuration of response



Repeatability close to max spec,
slow down motion

Yield at risk, stop
production

Adaptive motion
dashboard

OUR OFFER

>10% OEE improvement* achieved by

- 1. UPH improvement by self-adaptive production (multiple use cases)**
- 2. Yield & Process control by automated analysis & alerting**
 - Custom visualization, analysis & alerting for Process Parameters & KPIs
- 3. Downtime reduction by Predictive maintenance**
 - Prediction of critical component failure & alerts for preemptive repair

***OEE: Overall Equipment Effectiveness = Availability x relative UPH x Yield**

Finding out more ...

Online:

- Homepage
- 'ficonTEC Insider' Blog
- LinkedIn / Twitter
- Vimeo / YouTube
- Locations & Contacts



BONDLINE – Precision Die Bonding

Fully automated, precision die bonder cells focused on high-resolution passive positioning for photonic-enabled chips & dies, coupled with thermal attachment (position-&-attach. Accuracies down to the micron and even sub-micron range. Feature-rich functional modules provide thermal management, multiple bond force modes and eutectic/epoxy/soldering attachment capability.

> Learn more

CUSTOMLINE – Flexible Micro-assembly Platform

Our most adaptable and versatile multi-purpose micro-assembly platform, providing fully automated align-&-attach for (integrated) opto-electronic and photonic devices. These systems are designed to provide highly flexible and individual solutions for a broad range of tasks in a wide range of industrial production environments.

> Learn more

Fraunhofer | Tampere University | AIFOTEC

C2MI | Fraunhofer | AIM Photonics

BONDLINE
B800 / B1200 / B1600

Automated precision die bonder for photonic devices, utilizing a new, configurable and modular system approach, complete with production-optimized housing layout. Made for cassette-to-cassette and in-line high-volume manufacturing, as well as for R&D & NPI.

NEW
Next-generation
In-line BONDLINE systems

ficonTEC
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BLOG

