



Press release

Machine learning and AI in electronics production

Assured quality and tangible economic benefits

26. July 2023

- **AI in industrial production with growing market volume**
- **AI provides technical and economic benefits**
- **Automation and power electronics as additional focus topics at productronica 2023**

Artificial intelligence (AI) is clearly gaining momentum in electronics production and becoming a key focus topic in the industry. With numerous successful projects, the industry is integrating machine learning solutions to a greater extent into production lines. From November 14 to 17 in Munich, productronica 2023 will show what productivity opportunities arise as a result. Conceptual sponsor of the most important event for the industry is VDMA Productronics.

While the generative forms of AI have only recently been causing a stir in the public eye, with ChatGBT as just one example, the evolution of machine learning (ML) has already been underway for longer and, to date, much more quietly: The most important driver in electronics production is currently automated optical inspection (AOI) based on the technological development of image processing. In this area, repetition-based learning algorithms – systems with an adaptive approach – have been in the process of replacing conventional IT for over a decade. The same is also happening with comparable systems, for example, in preventive medicine, where the focus is on the automated intelligent analysis of the data from imaging procedures.

Artificial intelligence is also seen as an enabler for more productivity, and, as such, offers huge growth opportunities: The Canadian market research company Emergen Research reported a global market volume of 2.6 billion US dollars for

Messe München GmbH
Am Messesee 2
81829 München
Deutschland
messe-muenchen.de



Press release | 26. July 2023 | 2/2

‘AI in production technology’ in 2022 – with an average annual growth rate of 44.5% over the previous years. According to the forecast, this is expected to continue. Driving forces are predictive maintenance and the smart factory.

AI in industrial production with growing market volume

Almost all automated inspections systems in electronics production are already smart factory ready today. Although there is only an indirect link between the the volumes for both markets, the global market volume for AOI of around 650 million US dollars and annual growth of around 20% clearly confirm the trend. For products from all the leading companies in the market (including the companies Goepel, Koh Young, Saki, and Viscom as exhibitors at productronica 2023), the transition to using AI in system is clearly increasing.

Volker Pape, Chairman of the Board of the Productronics Association of the VDMA since 2017, and co-founder of Viscom and member of its Supervisory Board, explains: “The self-learning skills of our inspection systems have reached a high level of maturity where we are using AI. Since the frequency of errors in electronics production is manageable, our engineers had to create ‘artificial’ error patterns using image processing in order to achieve a more relevant learning sample for the AI and hence an even greater learning effect.”

Case study demonstrates technical and economic benefit of AI

Dr. Sebastian Mehl, whose task at Siemens AG is to integrate mature and working AI applications into production environments in electronics production, explains why AI plays such a major role in AOI applications: Even without AI, two thirds of the tested assemblies could be identified as good parts. Of the around 30% not in the first pass yield, only the smallest portion actually had an error.

If humans now took on the inspection for this amount of false calls in the second pass, it would entail significant additional inspection effort. Otherwise, there would be a high risk of several of the actual errors being overlooked, says Dr. Mehl. In SMT production lines at Siemens, the number of false calls has been halved, and the first pass rate increased by 15% with the aid of AI. Commenting on previous project

Press release | 26. July 2023 | 3/3

experience, Mehl says: “The additional inspection effort that is no longer required can be tangibly measured in annual six-digit savings.”

Using AI in the example mentioned not only improves quality but also quite clearly provides economic benefits. The aim of the MLOps team (Machine Learning Operationalized) is therefore to implement the AI-based technology in all production lines.

Other focus points at productronica 2023: automation and power electronics

The motto for productronica 2023 is “Shaping the future of electronics production”. In addition to AI in electronics production, automation trends in the industry, and the growing significance of power electronics are the other focus topics at this year’s world-leading trade fair for electronics development and production. VDMA’s main productronica stand will also focus more on the topic of sensors in electronics production.

More information: www.productronica.com

productronica

productronica is the world’s leading trade fair for electronics development and production and is supported from a conceptual and technical perspective by the Productronics Association of the VDMA (German Mechanical Engineering Industry Association). The trade fair has been held in Munich every two years since 1975 and the next productronica is due to take place from November 14 to 17, 2023.

productronica worldwide

In addition to productronica, Messe München organizes productronica China, productronica South China and productronica India. The network of electronics trade fairs also includes electronica in Munich, electronica China, electronica South China, electronica India, Smart Tech Asia, electronicAsia and LOPEC.

Messe München

Messe München is one of the leading exhibition organizers worldwide with more than 50 of its own trade shows for capital goods, consumer goods and new technologies. Every year, about 50,000 exhibitors and around 3 million visitors take part in more than 200 events at the exhibition center in Munich, at the ICM – Internationales Congress Center München, the Conference Center Nord and the MOC Veranstaltungszentrum München, and also abroad.

Press release | 26. July 2023 | 4/4

Together with its subsidiary companies, Messe München organizes trade fairs in China, India, Brazil, Russia, Africa, Turkey, and Vietnam. With a network of associated companies in Europe, Asia, and South America, and with around 70 offices worldwide for more than 100 countries, Messe München has a global presence.