

KÜNSTLICHE INTELLIGENZ (KI)

## KI in der Industrie: Auf diese Start-ups setzt Siemens



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### AI in industry: Siemens relies on these start-ups

*An industrial giant like Siemens is developing its own artificial intelligence (AI) solutions for its customers and plants. But that's only part of the Munich-based company's AI strategy. The Group also relies on an ecosystem of start-ups that cover special fields.*

Making artificial intelligence (AI) suitable for the industry is a team sport of automation, AI, and domain knowledge, finds Boris Scharinger. He is a Senior Innovation Manager in the CTO Office of Siemens. Most corporations would probably agree with that and probably claim all these competencies for themselves. Scharinger and his colleagues in Digital Industries, on the other hand, rely on an ecosystem of startups, that they bring to their customers to "develop robust solutions for the market." At a customer event, the Munich-based company invited a round of KI start-ups to present their industrial KI solutions for the first time.

### It won't work without AI

This does not mean, assures Scharinger, that the technology group is not investing in AI itself - quite the opposite: at the AI Lab in Munich, a team advises customers on AI strategy and possible applications and conducts research on robust algorithms. But Scharinger cautions that you can't do everything on your own. These are new sounds for industry observers.

There are many examples and approaches for successful collaborations: For example, AI algorithms are being subjected to a baptism of fire at Siemens plants, while other startups are relying on Siemens hardware for their solutions. In addition, Siemens can take over the MLOps part in a start-up partnership. This means that the Munich-based company distributes cloning models to production, monitors them, and updates them as required. Even Procter & Gamble was recently convinced that this works smoothly worldwide.

## Machines learn from each other

A largely unknown approach in the industry to escape the Distributed Data Dilemma is "federated learning". The Hamburg-based company Katulu uses this approach and lets machines learn from each other without learning about each other. This means that companies no longer exchange data with each other, but only trained models. The major smartphone manufacturers have been relying on this technology for some time: The "autocomplete" function for text input learns with each user - without their text input being sent to the cloud. Instead, it continues to train locally and only the overnight model adjustment is forwarded to the smartphone manufacturer.

The engineers at Katulu transfer this principle to mechanical engineering. Pumps or injection molding machines benefit from the technology. The company has its own AI- Edge software, that collects data. This creates a data lake, with which the model is trained locally. Model adjustments then go to the machine builder's backend - just as with the smartphone - and are aggregated into a new overall model. Data remains local and business secrets of any kind are thus protected.

## Extract information more easily

A data dilemma does not have Jochen Mattes from Werk 24. Its machine learning model continues to be trained each month with over 100,000 technical drawings. The idea behind it: The AI reads technical drawings and provides drawing legend, dimensions, tolerances, threads, chamfers, radii, and surface quality.

A few years ago, in his first job, Mattes visited a machine builder and observed an engineer printing out a technical drawing on A0 formats. He hung it on the wall and stood in front of it for half an hour, looking for the lowest tolerance. At that moment, Mattes realized that he needed to simplify this process.

The industry sends PDFs or image files with technical drawings to each other. Especially when it comes to ordering parts or components, companies ship these formats. The PDF files have a big disadvantage: information is not easy to extract and the human analysis of the drawings takes time. That's supposed to change with AI.

## Win car races with AI

But Scharinger and his team don't just have German companies on their radar. From England come the developers of Monolith AI, whose solution is already part of the Siemens ecosystem. The British bring references from the automotive industry. After all, whoever wins the 24 Hours of Le Mans has not only the best drivers at the wheel, but also the best car and the best technology behind the wheel.

The Jota team won the 2020,2021 and 2022 race series. For the development of the winning car Oreca 07 engineers relied on AI in engineering and testing. Officials were able to reduce wind tunnel testing by 80 percent using Monolith AI's KI platform. The developers from London promise "test less".

The Monolith AI approach goes even further than the booming simulation industry. Each simulation carried out further develops a model, because the creators rely on real-time data. This means that mechanical engineering could save itself numerous tests. Additionally, the AI makes suggestions to the developer about their product based on the real data. The British have ambitious goals: By 2026, the product development time of 100,000 engineers is to be reduced by 50 percent . The solution is integrated with the Siemens Mindsphere platform.

In addition to the British, the Belgians from Tangent Works are also represented in the ecosystem. Time series and their databases are in high demand at the moment - they are the basis for predictions and trends. Some weeks ago it became well-known that among other things Sequoia China together with other investors invests ten million US Dollar into Timecho and pushes thereby the project Apache IoTDB .

The developers at Tangent Works from Belgium have also discovered the appeal of time series and offer a augmented machine learning for time series. It supports users in building models from time series. The Belgians have developed the tool "Tangent Information Modeler (TIM)". At first glance, you might think it's a Auto ML tool, but the developers immediately deny that. Auto ML means the system suggests multiple models to the domain expert based on the data. However, this process is often very computationally intensive.

The Belgians call their approach "Instant ML" and are thus one step further in automation. In contrast to Auto ML, it is more resource-efficient. In the end, only one model for the application is created and at high speed, the Belgians assure. For many applications, it is only seconds. The tool comes as a SaaS solution, which has also been integrated into Mindsphere, but also runs "on premise" on an edge device if you want to bring the model to the machine.

The Siemens start-up scout Scharinger does not rely on founders who want to revolutionize the industrial world with all kinds of marketing. He has the Siemens customer and his needs in mind, because the challenge in AI projects is not the idea or the feasibility study in the laboratory, but the robust implementation and operation of the AI application.

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