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Petuum: artificial intelligence for industrial use

Petuum wants to bring companies closer to the AI world with its platform. The basis for this is the AI platform Symphony, which offers standard development methods.

Artificial Intelligence (AI) applications are now being used in many different industry segments. However, AI-focused vendors tend to focus on specific industries. Petuum, on the other hand, wants to provide a solution for all market sectors.

"Today's artificial intelligence solutions typically specialize in specific applications and functions. The application is maintained by a few developers," says Petuum CTO and co-founder Qirong Ho. "The solutions are labor-intensive, expensive, difficult to reproduce, and generally unsustainable. As a result, AI is currently inaccessible to most companies."

Using Petuum to develop your own AI platforms

Petuum was founded by Eric Xing (CEO and Chief Scientist) and Qirong Ho (CTO), who previously worked at Carnegie Mellon University. The software platform Symphony, developed by them, serves as a foundation on which companies can design, build, adapt and operate their own AI solutions.

Symphony is a distributed and parallel data processing platform that enables machine learning and deep learning workflows to be executed and scaled in a variety of environments.

Figure 1: The goal of Qirong Ho and Petuum co-founder Eric Xing is to industrialize AI technologies.

Due to the modular approach, AI applications in healthcare, industrial manufacturing, financial services, telecommunications and autonomous driving are conceivable. Petuum provides standardized processes, software design tools, computing and machine building blocks, and reference designs so that end users can design and operate KI solutions in series.

Application example cement industry

To illustrate the solution, Qirong Ho demonstrated the Petuum Industrial AI Pilot during a presentation . The tool integrates AI and machine learning algorithms to make predictions and analyzes for production.

The Industrial AI-pilot is helping CEMEX, the global cement manufacturer, to make its manufacturing processes more efficient so that the quality of the cement is constant, production can be increased as needed, and energy consumption reduced.

"The cement industry can use Industry 4.0 solutions to manage its complex and networked processes. With AI-pilot, analysis can be made more efficient, successful and cost-effective, " explains the Petuum CTO.

Although cement production is a standard production process, complex processes take place in the background during processing (see Figure 2). Petuum has therefore developed the Industrial AI-pilot and was thus able to achieve an increase in efficiency of around seven percent with CEMEX.

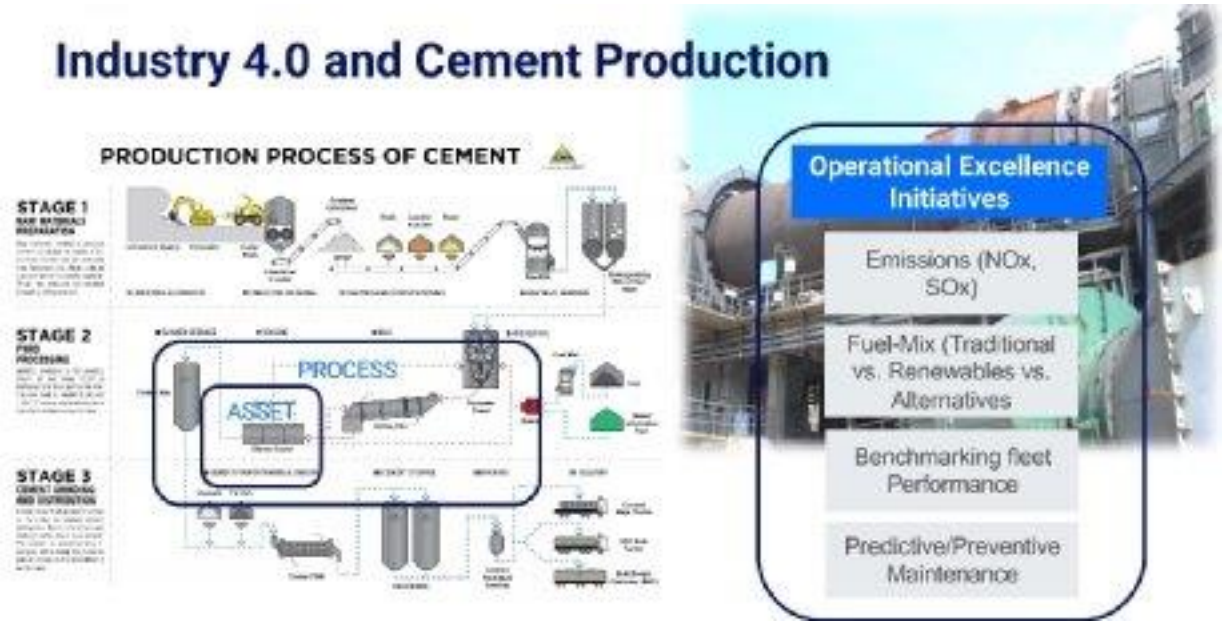

Figure 2: Production processes in cement production.

"Many people are unaware that the cement manufacturing process begins with the grinding of raw materials from coarse materials. Due to the different quality and different specifications, the process has to be adjusted and optimized in real time and around the clock," explains Ho. "Incorrect settings lead to production downtime, waste and instability of the complex process. Therefore, a narrowly defined process is necessary. The power of AI to ensure accurate forecasting and control comes into its own."

The platform collects historical and real-time data from the cement plant network. This data is analyzed with the assistance of machine and deep learning algorithms to make predictions about the various operating variables of the cement plant for a period of 15 minutes. The time constraint is due to the amount of data that must be recorded by thousands of sensors in the cement plant.

The predictions are based on dynamic analysis and non-linear relationships between the variables studied. The result is recommendations that are validated by an employee or automatically fed into the cement plant control system for autonomous optimization processes. This process is continuous, which allows the model to constantly improve.

At the beginning of October, the solution also convinced the jury at the CemTech trade show in Berlin, where the platform was honored within the Cement Industry Awards 2019.

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