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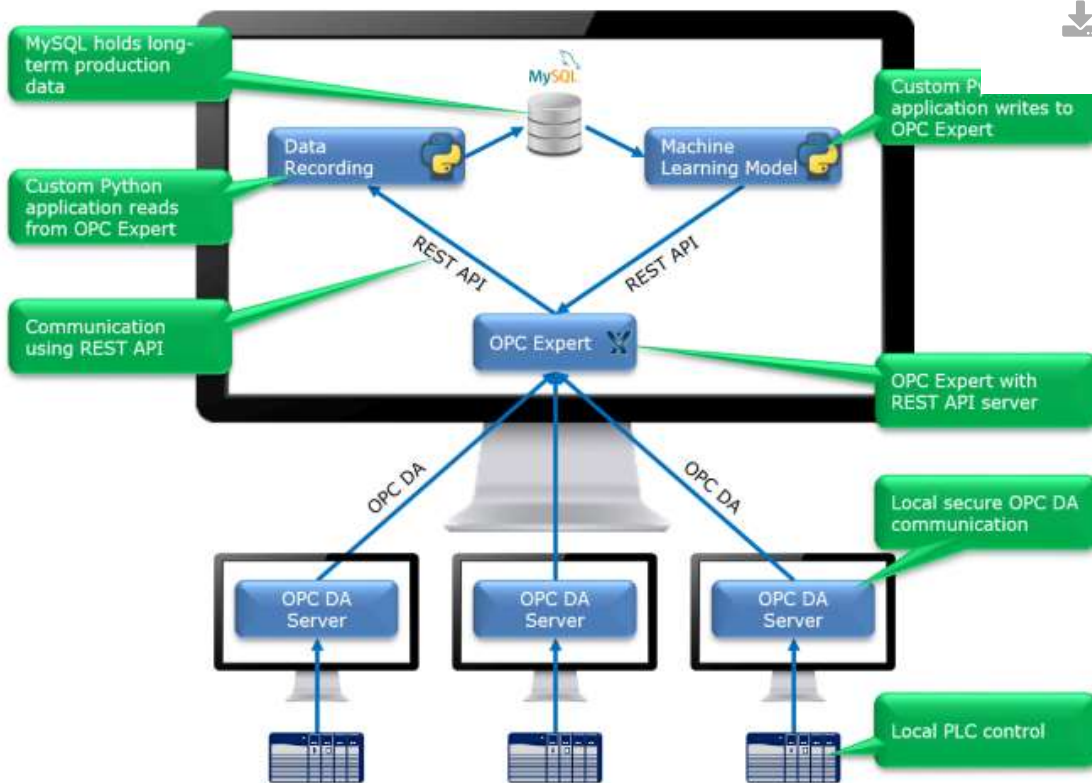
[INTRO](#)[FEATURES](#)[SCREENSHOTS](#)[WHO WE ARE](#)[SUPPORT](#)[PRICING](#)[SHOP](#)[CONTACT](#)[CASE STUDIES](#)[Home](#) / [Case Studies](#) / REST API (Python): Vigier Ciment

Ciment

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The “*Machine Learning in Optimal Control for Industry*” Team at Zürich University of Applied Sciences (ZHAW), worked in collaboration with Ciments Vigier SA. The project’s goal was to reduce environmental impact, improve cement clinker quality, and reduce energy consumption. Due to extremely harsh conditions during cement production, direct measurements were often difficult or impossible to capture. Consequently, ZHAW researchers deployed machine learning algorithms to solve the direct measurement problem.

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OPC Expert connects to remote OPC DA servers while enabling Python applications to connect via REST API. This architecture provides an easy way for programmers to interact with OPC servers for reading and writing plant data.

First, the team used historical process data from the plant to train machine learning algorithms. Using this big-data approach, ZHAW used their machine learning algorithms to develop models predicting measurements they could not obtain directly due to harsh manufacturing conditions such as extreme temperatures, corrosive gases, dust, and high vibration. Next, after training was complete, ZHAW's team deployed these algorithms using custom applications they wrote using Python. To access real-time OPC data, they used OPC Expert to convert OPC DA to REST API. This enabled the team to easily use REST API from their Python applications to read data from and write data to OPC DA servers across their network. This enabled plant operators to optimize production.

"OPC Expert REST API allowed us to easily integrate our custom applications into an already existing complex process control and analytics system at the cement plant," said Raffael Künzi, Research Associate at ZHAW. Künzi added, "OPC Expert removed a lot of OPC complications and enabled us to focus our efforts on developing our machine learning models with Python."

The deployment now uses OPC Expert, which has been running on a 24X7 basis for months at a time, stopping only for occasional computer update reboots. The operation has been reliable, and the team found it easy to work with OPC Expert's integration of OPC DA, REST API, and Python.

This joint project was funded by both the Swiss government and Ciments Vigier SA and has already shown potential to be able to reduce emissions of carbon dioxide, ammonia, and nitrogen oxides, improve clinker quality, and reduce the consumption of thermal and electrical energy.



About Raffael Kunzi

Raffael Kunzi of ZHAW works as a Research Associate in the team "Machine Learning in Optimal Control for Industry" which is part of the Institute of Applied Mathematics and Physics of ZHAW in Winterthur, Switzerland. The team's main area of research is the study and control of complex technological systems. They employ a variety of mathematical and physical tools with a focus on statistical mechanics and artificial intelligence.



About ZHAW

ZHAW is a University of Applied Sciences in Zürich focusing on key societal challenges, with a particular emphasis on energy and societal integration. With its expertise in sustainable development and digital transformation, ZHAW fosters research to respond and develop solutions to current economic and ecological demands.

With locations in Winterthur, Zurich and Wädenswil, the ZHAW is firmly anchored in its region whilst collaborating with international partners.



About Vigier Ciment

Vigier Ciment stands for quality and personal commitment. With 165 employees and an annual production of around

900,000 tons, Vigier is one of the most important Swiss manufacturers of cement. As

a pioneer of Swiss Portland cement production, Vigier combines tradition with innovation: Vigier's offering includes high-quality cements tailored to market needs as well as value-adding services. Vigier is certified according to ISO 9001, ISO 14001 and ISO 45001 and value long-term, personal relationships, professional expertise and practical experience. With Vigier's transport company, Vitrans, Vigier offers sophisticated logistics services and ensure punctual and rapid deliveries.

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