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Mr. Juergen Weichenberger

Schneider Electric, London, United Kingdom

A new AI-based Approach for Energy Efficiency Optimization in Chemical and Petro-Chemical Processes

Chemical and Petro-Chemical processes are requiring high quantities of Energy to convert raw materials into products or semi-products. Given the complexity of the processes and as well that they are often geographically widespread, it is becoming harder and harder of human operators to optimize them or even just keep them running at a point which is not creating unnecessary high quantities of CO₂. By introducing a new approach to model and optimize the processes, we are not only able to visualize the current state of a process, but we are also able to optimize the process in real-time and detect deviations and provide recommendations to prolong the ideal operational set points.

By introducing a combination of Artificial Intelligence, like Neuro-Evolutionary and Multi-Modal Models, in combination with Multi Agent Systems to model the process allows of not only to show the current state of the process but also allows us to optimize the process across the entire value chain. The Multi-Agent approach enables us also to overcome geographically disconnected processes and allow a better impact analysis.

The preliminary results have delivered a reduction in Energy Consumption of 7% percent while maintaining production at the target level. In addition, we achieved a carbon reduction of 4%.

Keywords: Energy Efficiency, Optimization, Carbon Footprint, Multi-Modal Models, Gaming Theory

Biography:

Mr. Juergen Weichenberger has 20 years of experience in building complex solutions leveraging advanced analytics, data science, database design, architecture, and other cutting-edge technologies.

Working in the AI industry since the mid-1990s, Juergen have built solutions for various industries and leveraged various methods over time.

He joined Schneider Electric in 2022 as Vice President AI New Value Stream. His focus is to produce industry grade solutions, translating the combination of core algorithms, robotic, cybernetics and human intelligence.

Previously, he worked as Senior Data Science Executive in Accenture and hold various roles related to AI and data.