

Smart Factory

for prediction-based system monitoring and management

System Invariant Analysis Technology

Challenge

System failures are the worst nightmares for any factory owner. A manufacturing company was facing a challenge where their facilities would sometimes stop working suddenly, causing delays in shipments. The company had tried to implement various technologies to help with this, but none of them were able to accurately identify the location of the problem or determine the reason behind its occurrence.

Solution

To help the company, NEC implemented its Advanced Analytics solution, which includes two key technologies: System Invariant Analysis Technology (SIAT) and its subset, time-series model-free analysis (D2D). SIAT works based on the principle of system invariance, which states that the relationships between different variables in a system will remain constant, even if the values change. In simple terms, SIAT keeps track of the relationship between different data variables, and the moment a relationship changes, it alerts us about the anomaly in real-time. One of its most functional features is that SIAT is a white box type of AI system so humans can easily understand how it works and why it detects certain anomalies.

Benefits

Using NEC's Advanced Analytics solution, companies can:

- Leverage SIAT's real-time detection to predict system abnormalities several days in advance.
- Perform maintenance based on detected information, enabling continuous production.
- Improve the efficiency and accuracy of their operations.
- Create and validate models specific to their industry without any prior knowledge of analytical techniques.

Towards the future

NEC's SIAT can be used in a wide range of applications, including: system monitoring, predictive maintenance, and quality control. It can be used to monitor the condition of machinery in a factory or the health of patients in a hospital. Beyond equipment failure, SIAT can also detect anomalies from sound and can be used to monitor the condition of roads by analyzing the sound of the traffic passing over.

More info

<https://www.nec.com/en/global/solutions/ai/software/index.html>



A drive towards greater sustainability

01 Reduced energy wastage
SIAT's early detection helps prevent breakdowns and maintains machine efficiency, saving energy in the process

02 Enhanced scalability
SIAT's ability to analyze systems of any size or complexity make it a versatile solution to build smarter and more efficient cities