



Even Smarter Pumps

With Edge Machine Learning

While every pump is made equal, they are used differently. A pump that fills beer bottles in a brewery operates in a different environment and under different conditions than a pump in a wastewater facility. What is considered normal for one pump may be an anomaly for another. The only way to handle this is by treating every pump individually, learning its specific conditions, and to do this in operations. This requires custom automation, and the solution spells Edge Machine Learning, where sensor data on the pump is used to train one machine learning model per pump, predict expected behavior, detect deviations, and simulate settings for how to run it at its best.

This approach allows you to do condition monitoring of every individual pump, using your existing sensors and actuators like voltage, pressure, flow, and vibration to generate predictive health indicators. You know everything there is to know about your pumps and how to run them, but this will empower you to also operate them based on their surroundings and applications. This is the next revolution for pumps, enabled by connectivity (IoT) and digitalization, where you extend the relationship with your products out into the field. And the insights do not stop at the pump itself. It will also show if a pipe is leaking or getting clogged, which turns the pump into a smart sensor – Pump-as-a-Sensor – adding even more value to the process or machine.

Ekkono provides the Edge Machine Learning software that enables all of this. Yes, it is all software that due to its tiny footprint can run on virtually anything, from an edge gateway to a PLC, or even onboard the pump

controller. We do learning on the device, using what is called incremental online learning, where the super-local conditions and configurations, like pipe dimension and length, are automatically incorporated. This way you reduce the amount of data that is sent to the cloud, enabling instant sharing of insights on-prem, improving data integrity, while still using the high-definition sensor data at the edge, and even re-learning when the conditions change.

Sounds interesting? Well, we thought so! Then wait until you see the use cases that this enables:

- **Cavitation detection** – catch indications of cavitation before it becomes fatal
- **Condition monitoring** – learn normal behavior to determine need for maintenance
- **Pump-as-a-sensor** – detect deviations outside the pump itself to enhance the machine or process
- **Self-optimization** – simulate settings in real-time to get best performance and minimize energy consumption and wear
- **Auto-installation** – run self-optimization during installation for best configuration
- **Virtual sensors** – replace expensive, hard-to-deploy, or unreliable physical sensors with calculated real-time values

Now, all you have to do is contact us to learn more. You find more information at www.ekkono.ai, and to schedule an inspirational call, send a request to info@ekkono.ai.

