Ai-MicroCloud™ for Manufacturing

New opportunities for AI and ML applications in manufacturing and supply chain management include demand, supply chain, production, maintenance, and life-cycle planning, as well as quality monitoring and predictive analytics. The benefits include reducing cost, customer churn, and waste while increasing agility, efficiency, productivity, and safety.

Zeblok's Ai-MicroCloud™:

Zeblok's Ai-MicroCloud™ is the most straightforward way to efficiently pipeline data, including the critical data comprehension step, and then quickly & affordably to develop, train and deploy pragmatic AI into mission-critical enterprise processes. Data scientists can start an AI/ML model in minutes, leverage open-source frameworks, a growing library of curated algorithms and accelerated data handling technology, scale seamlessly to high-performance computing (HPC) and deploy completed APIs in production.

Zeblok's Ai-MicroCloud™ provides a uniquely comprehensive AI/ML development environment:

- Portability – Deployed to data centers, public clouds and Edge locations
- Instant Usability – Start in minutes via a simple UI, with familiar frameworks
- Seamless Scalability – One click to scale to HPC
- The Right Algorithms – Proven, curated, easy to consume and share

AI and Machine Learning are giving manufacturers an unprecedented ability to skyrocket throughput, optimize their supply chain and accelerate research and development.

Accenture Report

Build Domain-Specific Manufacturing Applications

Ai-MicroCloud™ enables you to develop, deploy and manage bespoke real-time domain-specific AI applications in maintenance, repair and optimization, and precision manufacturing.

Ai-MicroCloud™ is a turnkey platform built on cloud native architecture for developers, data scientists, and researchers to create real-time, secure and scalable solutions. A simple user interface provides Jupyter notebooks, with access to all familiar open-source frameworks and popular data science language bindings such as R, Scala and Python.

Use Cases

Time Series Data Analytics

Predictive Maintenance: With each cycle of operation, machine components' original physical parameters deteriorate, requiring diagnostic inspection, maintenance and replacement. Optimizing maintenance time has financial impact. Provides failure prediction and detection, root cause analysis, failure type classification and mitigation recommendation.

Asset Health Predictive Maintenance: Increase return on assets with near real-time anomaly detection capabilities by forecasting equipment failure, reducing unplanned maintenance and increasing equipment uptime. Deploy models at all levels of manufacturing control operations – field level sensors, direction control level, plant supervisory level, production control level up to scheduling level.

Asset Failure Analysis: Anomaly detection leading to explainable forecasts so engineers can do root cause analysis. Analyze impact of local operating conditions and/or specific configuration of the asset vis a vis normal wear and tear**.**

Supply Chain Strategy Planning: Enable supply chains to (re-)act and adapt. ML can help create new, improve existing and evaluate more what-if scenarios. Maintain speed of innovation by predicting future market moves to align design initiatives, strategic product lifecycle planning and optimization, product maintenance design processes, etc.

Edge Video Analytics

Safety Gear detection: Detect number of objects such as safety vests, hardhats, bunny suit, safety glasses

Weld Porosity: Automatically detect porosity defects in gas metal arch welding. Classify as "normal" or "bad" weld

Intrusion Detection: Detect multiclass objects and alert when someone enters a restricted area

Platform Features Overview

AI Platform-as-a-Service delivered as Ai-MicroCloud™, including **Turnkey HPC Orchestration** and an **Intelligence Marketplace** for curated algorithms

- **Ai-WorkStation:** Customized and virtualized Jupyter notebook, with access to all familiar open-source frameworks, accelerated data lake and AI algorithms via a simple web interface

- **Ai-HPC-WorkStation:** Turnkey workload distribution to hundreds of GPUs for AI/ML model development, training and simulations

- **Accelerated Data Lake:** Enables a 10-15x reduction in search time

- **Intelligence Marketplace:** Growing library of carefully curated original AI algorithms, including exclusively in-licensed patent-pending software

  Easy to read, easy to use and easy to share

  Fast-track adoption of the best AI algorithms from academia and AI startups

- **Cloud Native:** Scalable architecture running in modern, dynamic environments using containers and declarative APIs

- **Ai-Rover™:** Analytics and data visualization notebook – domain-agnostic data discovery tool for large, multi-variate, high dimensional data analysis, using patent-pending explainable AI algorithm, exclusive to Zeblok

  Provides crucial data comprehension step as starting point for AI model development – patterns, correlations and causation

- **Quantum-Safe Entropy-as-a-Service:** Truly random numbers, generated by single photon detection (SPD) technology, delivered via container for integration within existing encryption key management

- **Runtime Environment:** Finished model pipeline easily promoted to a runtime API, including inferences running at the Edge

- **Multi-Cloud from Core to Edge:** Deploy Ai-MicroCloud™ anywhere, including enterprise data centers, public clouds and Edge locations

Partner Programs

- **Frontier:** CSPs and MSPs upsell Ai-MicroCloud™ to remain competitive; Specialized hardware manufacturers use Zeblok's orchestration to enable AI workloads on their hardware

- **Ingenuity:** Algorithm originators are able to develop their software more easily on our Ai-MicroCloud™ and we facilitate commercialization by including their algorithms in our Intelligence Marketplace

- **Insight:** Data providers benefit from our accelerated search capabilities

- **Build Intelligence Services:** Broad network of AI solutions firms help integrate AI into enterprises' mission-critical process

For more information: email [Mouli Narayanan](mailto:mouli.narayanan@zeblok.com)

Zeblok Computational Inc.
1500 Stony Brook Road
Stony Brook, NY 11794
www.zeblok.com
mouli.narayanan@zeblok.com
Phone: +1 (631) 223-8233