



## INTEL OPTIMIZED CASE STUDY SERIES

# How byteLAKE Creates AI-Driven Industrial Solutions Using Intel Xeon Scalable Processors

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Since its founding in Wroclaw, Poland in 2016, byteLAKE has pioneered the use of artificial intelligence (AI) and high-performance computing (HPC) to provide automated and data-driven solutions for a number of industries.

The company provides two core solutions for its customers. First, its CFD Suite employs a collection of AI models to accelerate the execution of Computational Fluid Dynamics (CFD) simulations. When integrated with leading CFD Computer-Aided Engineering (CAE) software tools and workflows, the solution suite enables engineers to reduce the time needed to get results from complex and expensive simulations driven by algorithms by a factor of at least 10 with a prediction accuracy above 93%. The solution is now available for the chemical industry, reducing mixing simulations time from hours to minutes. Second, through its Cognitive Services suite, the company provides AI-assisted visual inspection to monitor, analyze, understand, and optimize industrial processes and to improve the quantity and quality of the manufactured products. byteLAKE's Cognitive Services enable AI-powered analytics of big data, including IoT sensor data to identify trends in the information acquired from multiple sources and to avoid downtime through predictive maintenance. The solution is now available for the paper industry, enabling AI-assisted monitoring of the papermaking process.

Intel technology has been an integral part of the company's product and research work from the beginning. Martin Rojek, byteLAKE co-founder and CEO explained: *"We have used many Intel technologies for several years and have been impressed with their performance and scalability. All of our deployments are powered by Intel."*

Intel-based workload optimized solutions help the company in many ways. *“First of all, Intel technology is well known and broadly adopted by our customers, so we don’t need to convince them to change their infrastructure,”* says Rojek. *“Intel also provides solutions that can be deployed at the edge, as a local PC or backend server or for high-performance computing. Additionally the company offers software stacks which enable optimization of AI workloads.”*

byteLAKE has optimized its Cognitive Services using Intel Xeon Scalable processors with integrated Intel Deep Learning Boost and the Intel Distribution of OpenVINO toolkit. This combination has resulted in up to 10-times faster performance without any hardware upgrades or drops in model accuracy. These are critical performance gains that make the company’s products much more appealing to customers.

The application of the Intel OpenVINO toolkit in its Cognitive Services helps byteLAKE demonstrate that AI works efficiently as a tool for optimizing operations. *“With the use of OpenVINO, we are improving the performance of our algorithms tenfold, so we no longer need to migrate to an alternative GPU solution as we did in the past,”* says Rojek. *“This is a breakthrough for companies looking at AI and its implementation because they no longer need to upgrade their IT infrastructure or base their operations on a new form of computing.”* This further enhances byteLAKE’s value proposition because its customers do not need to factor in potential infrastructure upgrades to use its solutions.

## More Cost-Effective CPU Infrastructure

Most of the company’s customers for Cognitive Services are in manufacturing and paper industry, while the CFD suite is geared mainly to the industrial CFD simulations market. *“Both groups historically use a CPU-only infrastructure,”* says Rojek. *“Using Intel technology allows us to provide these customers with a more cost-effective solution on the CPU side without the need to upgrade their infrastructure. Being able to avoid the infrastructure upgrade has definitely shortened the sales cycle.”*

With the CFD Suite, byteLAKE customers can run simulations in 10 to 20 minutes that previously took four hours. Likewise, with Cognitive Services, customers can lower unplanned downtime by automating quality inspection. *“With regard to other products, our document processing solution has allowed teams to work seven times more efficiently by applying automation to invoice processing,”* says Rojek.

With the CFD Suite, the algorithms must process huge amounts of data constantly. *“For the inferencing (prediction) part, the Intel CPU is a preferred option over a GPU solution because of the tenfold increase in performance,”* Rojek says. *“Also in the inferencing phase (prediction), CPUs are a better fit from an architectural point of view compared with servers based on GPUs.”*

Most of the company’s CFD prospects already have some HPC infrastructure and the majority is CPU-only. *“We did a benchmark test and found that for the AI models training, four nodes with Intel Xeon Scalable Gold processors provide comparable performance to one GPU node,”* says Rojek. *“This information was particularly useful*



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Martin Rojek,  
co-founder and  
CEO, byteLAKE

*for our clients who could now determine what they needed to ensure the required level of training.” He continued: “We did another benchmark test on the speed of inferencing or predicting the results once the training was complete and found that the CPU was ten times faster than the GPU.”*

byteLAKE’s solutions can be deployed in the cloud, but the company expects the majority of customers will use their on-premise infrastructures. *“Our Cognitive Services solutions will likely be deployed in manufacturing environments where there is often either limited bandwidth or poor-quality connectivity,”* Rojek says. *“You need to process the data almost in real-time, and with the cloud there would be the additional overhead of sending huge amounts of images and other heavy data to the cloud and waiting for the response.”*

byteLAKE has further leveraged its partnership with Intel to start joint marketing activities and has gained visibility on Intel's website. *“We have already received inquiries through email and direct call as a result of these joint marketing activities,”* says Rojek.

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