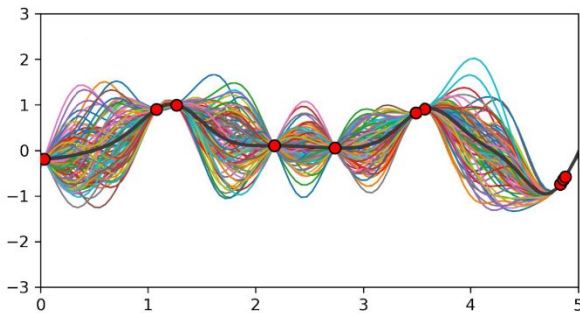**Press Release**

- CADFEM acquires stake in Augsburg-based AI company PI Probaligence (PI for short)
- PI develops AI solutions for extremely fast and accurate data-based predictions
- The PI technology will be presented at the CADFEM Conference in April

Machine learning for efficient simulation: PI Probaligence GmbH becomes part of the CADFEM Group

Artificial intelligence (AI) is fundamentally changing the way we live and work. Particularly in areas where the level of digitalization is already high, AI is a key to enormous leaps in efficiency; numerical simulations and engineering processes are ready to be put to use. CADFEM has brought PI Probaligence on board as a partner with outstanding solutions and expertise to provide customers with targeted support as they move into the world of AI.

January 29, 2024, Grafing near Munich: The megatrend of artificial intelligence (AI) is on everyone's tongue these days. Huge amounts of information are processed in artificial neural networks using high-performance computers and cloud computing in order to interpret or generate texts and images.

Other AI approaches have specialized in design optimization, experimental planning, or the disclosure of important correlations. These include machine learning (ML), which is an AI approach that learns by training on experiments, simulations, and other engineering data. As a result, ML offers enormous potential for using an existing data pool to massively accelerate and improve development and decision-making processes.

Machine Learning (ML): AI for Engineering
CADFEM, the specialist for simulation and digital engineering, aims to support customers in implementing the new technology in their digital process infrastructure so that its potential can be fully and sustainably utilized. This includes, for example, real-time applications for digital twins, autonomous decision-making processes, or intuitive workflows that make it very easy to use AI for individual issues.

CADFEM has established the necessary technical expertise. They are complemented by the close exchange with ANSYS, Inc., which includes the new Ansys AI solutions in the CADFEM portfolio. In addition, CADFEM relies on a proven strategy: for major future-oriented topics, the company's own network is expanded to include specialized partners and their expertise. This takes place under the umbrella of the international CADFEM Group, so that the additional know-how can be used worldwide.

Probaligence: AI experts who understand simulation
When selecting a network partner for AI, PI Probaligence GmbH quickly emerged as the perfect option for CADFEM and the requirements identified by CADFEM customers. The primary deciding factors were:

- the clear focus of PI on ML in combination with effective stochastic methods
- the PI philosophy of close integration of innovative research and industrial practical relevance, which suits CADFEM
- the unique PI algorithm STOCHOS, which combines expert independence, efficient utilization of computing resources, and high quality results.

Thanks to the combined approach of neural networks and Gaussian processes, STOCHOS offers outstanding prediction accuracy even with a small database. STOCHOS is also characterized by its ability to reliably evaluate real and noisy data from a wide variety of sources, including measured values, simulation results, and relevant key figures, and even combine them in a meaningful and resource-efficient way.

Last but not the least, the already existing proximity of PI to simulation is another strong argument. On the one hand, PI already works together with ANSYS, Inc. and on the other hand, the founders of PI are very familiar with simulation methods due to their previous professional and scientific activities.

By acquiring a stake in PI Probaligence GmbH, the CADFEM Group has further expanded its family of solution partners who combine important megatrends with the field of simulation within the global network.

"By working with PI, we are able to offer our customers comprehensive expertise in AI. PI will also help us to supplement established simulation methods with AI technologies. One conceivable application example is simulation-based digital twins. With ML, the computing times for the models can be reduced to a fraction of the usual time, meaning they can be carried out almost in real time."

Dr.-Ing. Christoph Müller, Managing Director at CADFEM International GmbH

PI Probaligence at the CADFEM Conference on April 10 and 11 in Darmstadt
In the first few weeks of cooperation, CADFEM, PI, and industrial customers launched several joint projects. For the first time in front of a large CADFEM audience, PI Probaligence will present itself at the CADFEM Conference on April 10 and 11, 2024 in Darmstadt (www.cadfem.net/conference). In addition to giving presentations in the sessions focusing on artificial intelligence, the PI team will be on site at an information booth.

"We are eagerly looking forward to our debut at the CADFEM Conference as part of the CADFEM Group. We have already built up a first-class reputation with leading companies in recent years, and with support from CADFEM, we expect a massive acceleration in the use of our unique AI methods."

Nils Odenthal, Managing Director at PI Probaligence GmbH

About PI Probaligence

PI Probaligence GmbH, based in Augsburg, was founded in 2018 as a spin-off of the Institute for Modeling and High Performance Computing at Niederrhein University of Applied Sciences. The focus is on developing powerful combinations of machine learning and stochastic analysis – Probabilistic Engineering Intelligence. The STOCHOS software is used to address complex engineering problems from the industrial sector. PI Probaligence not only develops and transfers machine learning solutions, but also supports their customized implementation.

The CADFEM Group has held a stake in PI Probaligence since the end of 2023. As a solution partner for AI and ML, the company supports CADFEM and its customers in the efficient implementation of AI technologies in simulation and engineering processes. www.probaligence.de

About CADFEM

CADFEM supports companies, research, and academic institutions in making the best possible use of the potential of simulation and digital engineering throughout the entire product development process. As an Ansys Elite Channel Partner, CADFEM relies on the leading technology of ANSYS, Inc. Because software alone does not guarantee simulation success, CADFEM customers benefit from a comprehensive range of complementary products, services, and training offers – all from a single source.

The globally active CADFEM Group (www.cadfemgroup.com) is one of the largest international providers of simulation technology. It has its origins in CADFEM Germany GmbH, which was founded 1985 as "CAD-FEM GmbH". www.cadfem.net

	Figure 01: Machine learning in action: adaptive model optimization (Image: PI Probaligence GmbH)
	Figure 02: Probabilistic intelligence: information understood as an increase in probability. (Image: PI Probaligence GmbH)
	Figure 03: The core of STOCHOS is the DIM-GP algorithm (DIM-GP = Deep Infinite Mixture of Gaussian Processes; This globally unique algorithm combines the advantages of two normally opposing AI approaches, neural networks and Gaussian processes. The resulting non-stationary, probabilistic model is infinitely scalable - it no longer requires hyperparameter tuning and processes data of any dimensionality with minimal hardware requirements and without cloud computing. (Image: PI Probaligence GmbH)
Download these images in high resolution from cadfem.net	

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