paceval. The most efficient way to execute complex mathematical models.
From CPUs to AI agents. From explicit formulas to calculable certainty.

paceval.
Create value fast.

*pace*val. is a mathematical engine and software library developed by paceval UG that serves as a reusable computation layer for evaluating complex mathematical expressions with high performance and numerical reliability. It works directly on formulas written in plain text, covering arithmetic, transcendental, logical and conditional operations. Each expression is transformed once into an optimized internal execution structure and then reused for efficient evaluation at scale for large data sets or recurring decision processes.
This results in deterministic, reproducible outcomes, automatic parallelization across available processor cores and high performance with low energy consumption across a wide range of hardware platforms, from smallest embedded systems to cloud servers. Expressions may contain any number of variables and are evaluated with selectable precision. In addition to numerical results, **pace**val. can provide trusted error intervals that explicitly bound floating-point inaccuracies, enabling transparent, explainable and auditable computation instead of opaque numerical outputs.

*pace*val. is used across a wide range of application domains, wherever complex mathematical models must be evaluated reliably, repeatedly and at scale:

- **Applied mathematics and engineering:** *pace*val. is used to solve mathematical problems in physics, engineering, statistics and finance, such as motion simulation, structural analysis, risk modeling and probability calculations. It is particularly effective in scenarios where the same mathematical model must be evaluated millions of times with different input data.

- **Software development and digital products:** *pace*val. enables mathematical models to be treated as data rather than hard-coded logic. This allows formulas to be updated without recompilation, supports long-term maintainability and enables efficient execution across platforms ranging from embedded systems to cloud services.

- **AI research, explainable AI and regulated AI: paceval UG** has developed a method to convert neural networks into closed mathematical functions. This improves transparency, comparability, optimization and certification of AI models and supports deterministic, auditable inference on any hardware platform, including systems without GPUs.

- **Sustainable and sovereign hardware development:** Within a project for the Federal Agency for Disruptive Innovation SPRIND, **paceval UG** developed a novel mathematical coprocessor concept based on the *pace*val. engine. Independent studies have shown that neural network inference using this approach can be performed more than 100× more energy-efficiently than GPU-based solutions, across platforms such as Apple Silicon, Intel/AMD, ARM, RISC-V, FPGA and ASIC.

- **Data platforms, digital twins and edge intelligence:** *pace*val. enables complex mathematical logic to be executed close to the data source. This includes execution directly in databases, digital twins or edge devices. As a result, latency and bandwidth requirements are reduced, operational costs are lowered and governance and traceability are improved.

- **Mathematical research and education:** *pace*val. is used to build and evaluate mathematical models and is widely applied in education to teach mathematical reasoning through explicit, transparent expressions.

*pace*val. is the result of more than 30 years of deep mathematical innovation. It empowers developers, scientists and AI engineers to execute high performance and transparent calculations anytime and anywhere.

We built ***pace*val.** to make certainty calculable.

Contact: info@paceval.com
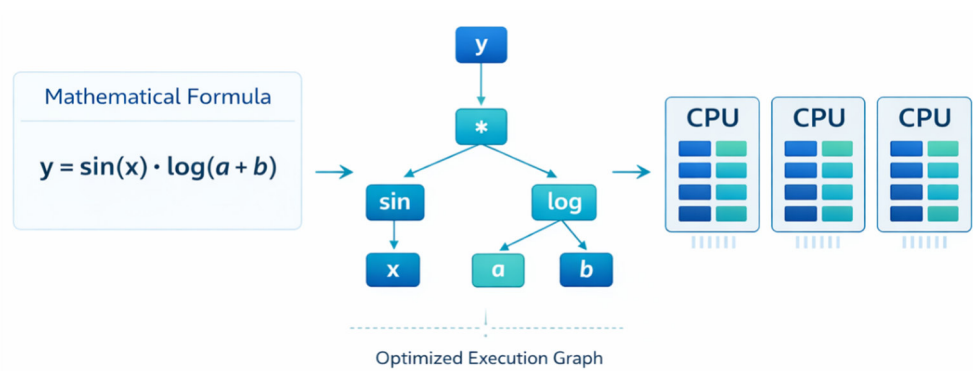
*pace*val. Executing Mathematical Models at Scale

Figure 1. *pace*val. Mathematical Execution Engine

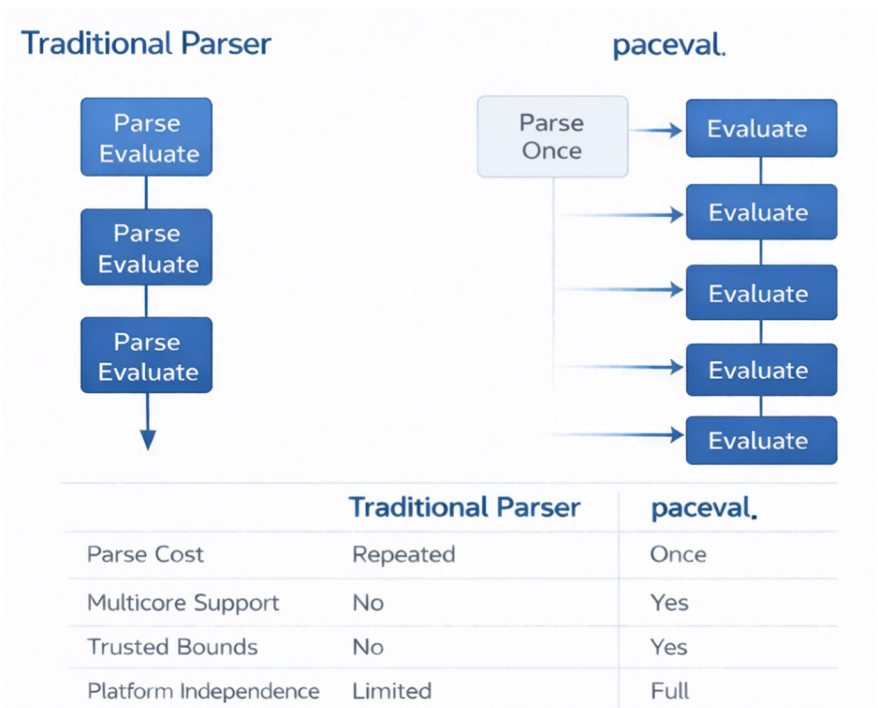|	Traditional Parser	paceval.
Parse Cost	Repeated	Once
Multicore Support	No	Yes
Trusted Bounds	No	Yes
Platform Independence	Limited	Full

Figure 2. Comparison of Traditional Formula Parsing and *pace*val. Execution Model

You can download the free ***pace*val.**-Software Development Kit at https://paceval.com.

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