paceval.
Create value fast.

***pace**val.* is a software library from paceval UG that can calculate almost any complex mathematical expressions. The software reads in a textual description of the formulas, which may contain the basic arithmetic operations, the usual transcendental functions (trigonometry, exponential function, etc.) and other common operations. Expressions can contain any number of placeholders (variables). Calculations are performed with selectable precision (single, double and extended with 80bit). In addition, the library can also output an interval that specifies the error limits due to the limited precision of floating point number formats.

***pace**val.* is used in a variety of applications, including:

- **Mathematical research and education:** ***pace**val.* can be used to solve mathematical problems and create mathematical models. It is often used in math education to teach students how to use mathematical expressions.

- **Applied mathematics:** ***pace**val.* is used in applied mathematics to solve problems in fields such as physics, engineering, statistics and finance. For example, ***pace**val.* can be used to calculate the motion of an object, analyze the structure of a building or calculate the probability of an event.

- **Software development:** ***pace**val.* is used in software development projects to implement mathematical calculations. For example, ***pace**val.* can be used to calculate the graphics of an object, evaluate the performance of an algorithm or determine the fault tolerance of a system.

- **AI research and innovation:** paceval UG has developed a method to export neural networks into mathematical functions. This is helpful to better understand the functioning of a neural network and to compare, evaluate, optimize and certify neural networks according to regulatory requirements. The method also offers the possibility to perform neural network inference with ***pace**val.* on any hardware, especially without GPUs.

- **Sustainable hardware development:** paceval UG has developed a new type of mathematical coprocessor for the Federal Agency for Disruptive Innovation SPRIND, which performs mathematical calculations more efficiently on any hardware (e.g. APPLE Silicon, INTEL/AMD, ARM, RISC-V, FPGA or ASIC). Studies by an independent computer science institute have shown that the inference of neural networks based on this coprocessor can be carried out more than 100 times more energy-efficiently with ***pace**val.* compared to GPUs.

***pace**val.* is a powerful tool that can be used for a variety of tasks. It is the best choice for developers, mathematicians and scientists who need to perform complex mathematical calculations.

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