intpakX - a Maple Power Tool for verified numerical computing

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intpakX v1.0 provides a data type for real intervals and the necessary operators and functions for validated computations (including directed rounding for validated results). Two applications are included which combine these arithmetic capabilities with Maple’s visualization potential: An implementation of the Interval Newton Method and Range Enclosure for functions of one or two real variables, both with graphical output.

Moreover, data types and some functions for complex disc arithmetic are implemented in the package. These are applied in algorithms for the range enclosure of complex polynomials. Visualization is provided for complex disc arithmetic as well.

With intpakX v1.0, Maple is also turned into a software for multiple precision interval arithmetic [5]. Some results of multiple precision computations are presented.

Keywords: Maple, Interval Analysis, Multiple Precision Interval Arithmetic, Disc Arithmetic, Visualization of Self Validating Numerical Algorithms, intpakX


[4] Maple PowerTool Interval Arithmetic; available from
http://www.mapleapps.com/powertools/interval/Interval.shtml