



LOGIC AND COMPUTATION

How do PVS strategies help to prove correct float-point implementations?

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Abstract.

Numerical programs are usually taught using real arithmetic but implemented in floating-point arithmetic. The Floats domain does not inherit known Real properties such as distributivity and carries propagating representational errors that can lead to unexpected behaviors. It is hazardous for safety-critical applications such as air traffic management. Following a methodology introduced by M. Moscato, L. Titolo et al., given a logically verified PVS Real specification, it is possible to get a provably correct floating-point implementation, for which it is also possible to obtain mathematical certificates (proofs) ensuring its correct behavior. The proof structure of such certificates is suitable for being fully proved using PVS strategies. This talk will show how we develop PVS strategies to improve proofs' automation degree.