

- ▶ MARTIN ZIEGLER, *Logic of Computing with Continuous Data: Foundations of Numerical Software Engineering*.
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Over 30 years after introducing the IEEE 754 standard, Numerics still gyrates around floating point numbers: from specification (e.g. of `e04bbc` in the NAG library) via analysis (unit-cost/realRAM/Blum-Shub-Smale model) and implementation to verification. Yet their violation of Distributive Law, of Intermediate-Value Theorem, and of Quantifier Elimination hampers rigorous approaches to Numerical Software Engineering: Modern Calculus builds on real (rather than rational) numbers for a reason!

We reconcile the convenient algebraic perspective on real computation (Bürgisser) with Computable Analysis (Grzegorzczuk, Pour-El, Weihrauch) by developing Turing-complete semantics for operating on continuous structures (Poizat, Zucker). This imperative counterpart to realPCF (Escardo) extends the powerful formal tools of Software Engineering from the discrete to the continuous realm with benefits to numerical practice.