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Formalization of the Integral Calculus in the Pvs Theorem Prover

By Ricky W. Butler

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 32 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. The PVS Theorem prover is a widely used formal verification tool used for the analysis of safety-critical systems. The PVS prover, though fully equipped to support deduction in a very general logic framework, namely higher-order logic, it must nevertheless, be augmented with the definitions and associated theorems for every branch of mathematics and Computer Science that is used in a verification. This is a formidable task, ultimately requiring the contributions of researchers and developers all over the world. This paper reports on the formalization of the integral calculus in the PVS theorem prover. All of the basic definitions and theorems covered in a first course on integral calculus have been completed. The theory and proofs were based on Rosenlichts classic text on real analysis and follow the traditional epsilon-delta method. The goal of this work was to provide a practical set of PVS theories that could be used for verification of hybrid systems that arise in air traffic management systems and other aerospace applications. All of the basic linearity, integrability, boundedness, and continuity properties of the integral calculus were proved. The...



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