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Biblioscholar, United States, 2012. Paperback. Condition: New. Language: English . Brand New Book \*\*\*\*\* Print on Demand \*\*\*\*\*. A one dimensional Kalman Filter algorithm provided in Matlab is used as the basis for a Very High Speed Integrated Circuit Hardware Description Language (VHDL) model. The JAVA programming language is used to create the VHDL code that describes the Kalman filter in hardware which allows for maximum flexibility. A one-dimensional behavioral model of the Kalman Filter is described, as well as a onedimensional and synthesizable register transfer level (RTL) model with optimizations for speed, area, and power. These optimizations are achieved by a focus on parallelization as well as careful Kalman filter sub-module algorithm selection. Newton-Raphson reciprocal is the chosen algorithm for a fundamental aspect of the Kalman filter, which allows efficient high-speed computation of reciprocals within the overall system. The Newton-Raphson method is also expanded for use in calculating square-roots in an optimized and synthesizable twodimensional VHDL implementation of the Kalman filter. The two-dimensional Kalman filter expands on the one-dimensional implementation allowing for the tracking of targets on a real-world Cartesian coordinate system.

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