



Modeling, Design, and Simulation of Systems with Uncertainties

By Andreas Rauh

Springer-Verlag GmbH Jul 2011, 2011. Buch. Book Condition: Neu. 245x164x27 mm. Neuware - To describe the true behavior of most real-world systems with sufficient accuracy, engineers have to overcome difficulties arising from their lack of knowledge about parts of a process or from the impossibility to characterize it with absolute certainty. Depending on the application at hand, uncertainties in modeling and measurements can be represented in different ways. For example, bounded uncertainties can be described by intervals, affine forms or general polynomial enclosures such as Taylor models. A stochastic uncertainty can be characterized in form of a certain distribution described, for example, by mean values, standard deviations and higher-order moments. For both bounded and stochastic uncertainties, there exist observer tools applicable offline as well as online. The contributions to this Special Volume on Modeling, Design, and Simulation of Systems with Uncertainties belong roughly to the three following groups. First, we present works highlighting the theoretic background and current research on basic algorithmic approaches in the field of uncertainty handling. The second group concerns real-life application scenarios from various areas including but not limited to mechatronics, robotics, and (bio-)medical engineering. The Special Volume is concluded by works dealing with new approaches...



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