

A SEARCH ALGORITHM FOR CALCULATING VALIDATED RELIABILITY BOUNDS

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The search algorithm presented builds on previous work done by the Author [1]. It allows the CDF of a dependent variable to be bounded with 100% confidence, and allows for a guaranteed evaluation of the error involved. These reliability bounds are often enough to make decisions, and require a minimal number of function calls. The procedure is not intrusive, i.e. it can be equally applied when the function is a complex computer model (black box). The proposed procedure can handle input information consisting of probabilistic, interval-valued, set-valued, or random-set-valued information, as well as any combination thereof. The function as well as the joint pdf of the input variables can be of any type.

References

[1] Tonon, F.: On the use of Random Set Theory to bracket the results of Monte Carlo simulations, *Reliable Computing* **10** (2004), pp. 107-137.