Capture basin approximation using interval analysis

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Résumé en anglais	This paper proposes a new approach for computing the capture basin C of a target T. The capture basin corresponds to the set of initial state vectors such that the target could be reached in finite time via an appropriate control input, before possibly leaving the target. Whereas classical capture basin characterization does not provide any guarantee on the set of state vectors that belong to the capture basin, interval analysis and guaranteed numerical integration allow us to avoid any indetermination. We present an algorithm that is able to provide guaranteed approximation of the inner C− and the outer C+ of the capture basin, such that C−⊆C⊂C+. In order to illustrate the principle and the efficiency of the approach, a testcase on the 'car on the hill' problem is provided. Copyright © 2010 John Wiley & Sons, Ltd.
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