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Kernel characterization of an interval function. (English) Zbl 1302.65117

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Summary: This paper proposes a set-membership approach to characterize the kernel of an interval-valued function. In the context of a bounded-error estimation, this formulation makes it possible to embed all uncertainties of the problem inside the interval function and thus to avoid bisections with respect to all these uncertainties. To illustrate the principle of the approach, two testcases taken from robotics will be presented. The first testcase deals with the characterization of all loops of a mobile robot from proprioceptive measurements only. The second testcase is the localization of a robot from range-only measurements.

MSC:

[65G20](#) Algorithms with automatic result verification

[65G30](#) Interval and finite arithmetic

[65G40](#) General methods in interval analysis

[68T40](#) Artificial intelligence for robotics

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Keywords:

[interval analysis](#); [kernel](#); [robotics](#); [localization](#); [loop closure](#)

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