# A simple SLAM example with IBEX
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**Abstract**: This talk is a tutorial on Ibex, a C++ contractor-oriented library for interval computations (Ibex and its low-level syntax were already presented in Swim 2012 and this talk is somehow a follow-up). We will apply a contractor programming approach to solve a small problem of localization and map building. The problem consists in an idealized robot moving randomly and measuring at each time steps its speed and its distance from a set of approximately known beacons (as if it was equipped, say, with a laser telemeter). We also assume that measurements are subject to outliers with a known probability, so that the maximal number of outliers occuring may be safely bounded with a near-1 probability. Contractors will be first built for each of the involved equations. We will then focus on the important issue of input/output in contractor programming since intervals corresponding to different mathematical variables have to be "serialized" in a single raw box to be processed by contractors. Suprisingly, no additional programming tool is actually necessary to handle this serialization and deserialization. Forward and backward evaluations on projection functions will do the job. Operators (like fixpoint) will then be applied on contractors for propagating contractions made by each measurement and obtain a global trajectory of the robot from its initial position. Finally, a special operator will be introduced, the q-intersection, that compose contractors in a special way so that the result is robust with respect to the maximal number of outliers.