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Refereed Article

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A Constraint-Based Approach to the Description and Detection of Fitness-for-Purpose

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Abstract: *This paper introduces the notion of* fitness-for-purpose, *presents a tractable, approximate approach to the recognition of fitness-for-purpose, and describes a working implementation using constraint programming.*

The property of fitness-for-purpose *states whether running a software component with a supplied set of inputs can satisfy a given goal. Our interest is to assess whether a chosen problem solver, together with one or more knowledge bases, can satisfy a given problem-solving goal. In general, this is an intractable problem. We therefore introduce an effective, practical,* approximation *to fitness-for-purpose based on the* plausibility *of the goal. We believe that constraint programming provides a natural approach to the implementation of such approximations. We took the Common LISP constraints library SCREAMER and extended its symbolic capabilities to suit our purposes.*

Publication and review history

This work was first presented at the Machine Intelligence 17 Workshop, held on July 19-21, 2000 at Bury St Edmunds, Suffolk, UK. Attendance at this workshop was based on invitations. Speakers at the workshop were invited to submit their articles for consideration in the forthcoming workshop volume. The subsequent publication and review history for the present article was as follows.

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5. Revised version appears in Electronic Transactions on Artificial Intellligence, Volume 4 (2000), section B, pages 155–183. The section and the annual volume are made permanently available at
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