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Refereed Article

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Teleo-Reactive Programs and the Triple-Tower Architecture

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Abstract: *I describe an architecture for linking perception and action in a robot. It consists of three "towers" of layered components. The "perception tower" contains rules that create increasingly abstract descriptions of the current environmental situation starting with the primitive predicates produced by the robot's sensory apparatus. These descriptions are deposited in a "model tower" which is continuously kept faithful to the current environmental situation by a "truth-maintenance" system. The predicates in the model tower, in turn, evoke appropriate action-producing programs in the "action tower". It is proposed that the actions be written as "teleo-reactive" programs — ones that react dynamically to changing situations in ways that lead inexorably toward their goals. Programs in the action tower are organized more-or-less hierarchically — bottoming out in programs that cause the robot to take primitive actions in its environment. The effects of the actions are sensed by the robot's sensory mechanism, completing a sense-model-act cycle that is quiescent only at those times when the robot's goal is perceived to be satisfied. I illustrate the operation of the architecture using a simple block-stacking task.*

Publication and review history

This work was first presented at the Machine Intelligence 18 Workshop, held on September 19-21, 2001 at the University of York, 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 5 (2001), section B, pages 99–110. The section and the annual volume are made permanently available at
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6. Paper editions of the ETAI issue and the ETAI volume containing this artice *republished* by the Royal Swedish Academy of Sciences.

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