Genetic fuzzy real-time controller

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Inventor(s):	CALLAGHAN VICTOR [GB]; HAGRAS HANI [GB]; COLLEY MARTIN JOHN [GB]	
Applicant(s):	WIVENHOE TECHNOLOGY LTD [GB]	
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Abstract of **GB 2350695 (A)**

Apparatus and method for the control of a machine to perform a predefined operation and able to learn control solutions when in an indeterminate environment. The apparatus includes a plurality of fuzzy-logic controllers FLCs each having a respective behaviour membership function MF definition and a respective rule base, each of said behaviour membership function definitions and rule bases being dynamically modifiable during operation as learning progresses. A plurality of sensors sense a respective parameter of the environment and feed information to the fuzzy-logic controllers A coordinator receives the outputs of the fuzzy logic controllers, to weight the effect thereof and to provide suitable drive signals for the driving of a multiplicity of actuators which control operation of the machine.; An experience bank stores past experiences of previous learning cycles and a learning focus engine receives information from the coordinator, to learn either new behaviour membership function definitions or new rules for the rule bases of the fuzzy-logic controllers. An adaptive genetic mechanism is provided with information from the learning focus engine and also is configured to search the experience bank so as thereby to generate a solution for loading into the fuzzy-logic controllers thereby to influence the control of the machine, dependent upon information supplied by the sensors. Such a solution takes the form of new behaviour membership functions or new rules for the rule bases thereof.
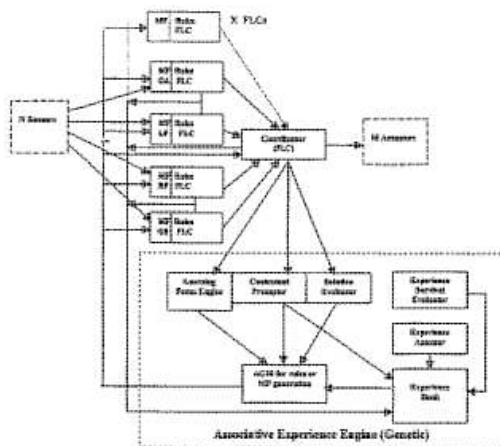
Figure 1 – Architectural Overview of Invention

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