Cartesian Genetic Programming

Abstract: Cartesian Genetic Programming (CGP) is a well-known form of automated problem solving known as Genetic Programming (GP). CGP was developed by Julian Miller in 1999. It can be used to solve many kinds of computational problems. It uses a very simple integer address-based genetic representation of a program in the form of a directed graph. Graphs are very useful program representations and can be applied to many domains (e.g. electronic circuits, neural networks).

In a number of studies, CGP has been shown to be comparatively efficient to other GP techniques. It is also very simple to program. The classical form of CGP has undergone a number of developments which have made it more useful, efficient and flexible in various ways. These include automatically defined functions (modular CGP), self-modification operators (self-modifying CGP) and encoding artificial neural networks.