Solution of Algebraic Equations by Using Self-Adaptive Computational Methods and Machine Learning

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Abstract

Many scientific and engineering problems can be described by algebraic equations. In order to answer important scientific questions it is necessary to solve appropriate algebraic equations. The process of deriving new mathematical methods and using existing mathematical theorems is extremely complex and time-consuming. In order to speed-up this process and remove possible errors it possible to apply autonomous self-adaptive and self-learning computational methods.

Solution procedure of some some selected mathematical equations can be found by using some special classification problems. In order to train appropriate neural-networks it is possible to apply automated self-learning.

In this presentation a combination of autonomous self-adaptive software and machine-learning techniques will be applied for autonomous development of the theory of the solution of some selected algebraic equations.

Presented methods can be applied for autonomous development of many different scientific and engineering problems. Self-adaptive and autonomous methods are in many cases much faster than traditional scientific techniques and produce solutions without errors. Scientific problems are extremely complex and the process of improving scientific concepts practically never ends.

In some occasional cases the process of improving contains finite number of steps. However, usually once the process of autonomous self-improvement starts it runs practically indefinitely. In order to get useful results it is possible to interact with the system on continuous basis and control the computational process. Efficiency of the system can be increased by using parallel and distributed computing.