

# Evolutionary Neural Logic Networks

Athanasios Tsakonas

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## Summary

Modern intelligent connectionist systems such as artificial neural networks have been proved very powerful in a wide area of applications. Consequently, the ability to interpret their structure was always a desirable feature for experts. In this field, the neural logic networks (NLN) by their definition are able to represent complex human logic and provide knowledge discovery. However, under contemporary methodologies, the training of these networks may often result in non-comprehensible or poorly designed structures. An evolutionary system is proposed, which uses current advances in genetic programming that overcome these drawbacks and produces neural logic networks which can be arbitrarily connected and are easily interpretable into expert rules. To accomplish this task, the genetic programming process is guided using a context-free grammar and the neural logic networks are encoded indirectly into the genetic programming individuals. The proposed system is tested in several application domains related to management, finance, engineering, medicine etc. Results are examined both in terms of the solution interpretability that can lead in knowledge discovery, and in terms of the achieved accuracy.