Department of Computer Sciences
University of Salzburg

PS Natural Computation
SS 2009

GOjen – Evolution of ANN Input Features

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Project Members:

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Abstract

The goal of this project is the evolution of input features for ANN (artificial neural network) Go players within the GOjen platform. ANN players in GOjen employ temporal difference learning for network training. Opposed to the classical approach of mapping each point on the board to each input neuron, different board representations try to capture structural relationships between points (and stones) essential to the game. Not all of these input features may be beneficial or even necessary for the fitness of the ANN. This project analyzes the impact of specific input features on the ANN's fitness and assess which can be excluded. The ANN evolution in GOjen is extended to additionally encode activation of input features in the ANN's genome. The usefullness of this approach is tested in an experiment where the scores of ANN players with and without evolved input features are compared in a tournament within GOjen.

8 Milestones

- 25.03.2009: project kick-off
- 01.04.2009: getting familiar with Go-Gameplay and GOjen
- 15.04.2009: understanding the working concepts of GOjen (source-code)
- 22.04.2009: understanding how to evolve and evaluate input features
- 06.05.2009: begin coding
- 03.06.2009: testing and evaluating
- 10.06.2009: finalizing project

9 Working Progress

9.1 Week 1, Wednesday, 25.03.2009

- begin
- taking a look at basics of Go gameplay
- create website and put it online
- read paper: Learning by Temporal Difference
- create 1st presentation for lesson
- write abstract
- begin work document
- group discussion

9.2 Week 2, Wednesday, 01.04.2009

- taking a deeper look at basics of Go gameplay
- first steps with GOjen
- update website and workpaper
- create 2nd presentation for lesson
- group discussion about detailed parts of the problem

9.3 Week 3, Wednesday, 08.04.2009

- understanding Go gameplay
- group discussion

9.4 Week 4, Wednesday, 15.04.2009

- taking a introductive look at GOjen sources
- group discussion

9.5 Week 5, Wednesday, 22.04.2009

- taking a deeper look at GOjen sources
- understanding how to deactivate input neurons
- understanding the connections between Player, InputAdapter and ANN
- taking a first look at ANN evolution basics
- group discussion

9.6 Week 6, Wednesday, 29.04.2009

- put presentations online
- correct milestones
- begin to write introduction
- create diagramm to show the connection between Player, InputAdapter and ANN
- group discussion

9.7 Week 7, Wednesday, 06.05.2009

- create 2nd presentation for lesson
- correct abstract on website
- write introduction
- taking a look at JEvolution
- group discussion

9.8 Week 8, Wednesday, 13.05.2009

- taking a look at GOjen source code
- begin coding
- group discussion

9.9 Week 9, Wednesday, 20.05.2009

- continue coding
- testing created code
- group discussion

9.10 Week 10, Wednesday, 20.05.2009

- reformulating the work paper
- testing
- group discussion

9.11 Week 11, Wednesday, 10.06.2009

- testing and evaluating
- fixing some programming problems
- group discussion

10 Subproject Responsibilities

- Report: Axel Baumgartner
- GO-Gameplay: Alexander Zrinyi
- GOjen-NeuroPhylogeny: Siegmar Alber
- GOjen-EvolverView: Luca Debiasi

11 Links

- Project Page: `http://uni.salber.net/semester4/natcomp/`
- PS Page: `http://www.cosy.sbg.ac.at/~helmut/Teaching/NaturalComputation/proseminar.html`