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| --- | --- |
| Subject | Date and time |
| Discussion | 4th 13 |
| Conclusion and abstract | 6th 14 |
| 1\_ small points 2\_ abstract 3\_ related work 4\_ conclusion 5\_ rest of methodology | 8th 15 |
| Last deadline | 8th 23 |

Q1: github acc?

https://github.com/ahnthttps://github.com/Hintzelab/MABE

Q2: population = generation \* 4?

Population = 4 \* number of groups

Clone mode: total number of genotypes = population \* 4 \* number of generations

Group mode: total number of genotypes = population \* number of generations

Q3: if we set the lod resolution, will we have all the agents’ information?

No. lod just contain info of one of the groups at each generation

The variance of the rawColumn

pandas

python library -> DataFrames

D=read\_csv(“filename.csv”)

myColumn=D[“score

myColumn=D[“score”]

myC=list(D[“score”])

while len(myC)<50:

myC.append(myC[-1])

So, the comparison shows that rewarding scheme affects their behavior.

Question: I believe we should not consider two columns of score and own score. we should use only row scores, and make three more columns that are max, min and average and then based on them make the comparisons. However, score based on the rewarding scheme will be similar to one of them but because we need all of them it is better to have them for each row.

Question 1: from the graph with generation as x axis what can ve conclude?

Just in presentation talk about signals

Question 2: How should we deal with average of averages problem? Because we each replicate has its average. Then we have 21 replicates for each scenario so again we should make an average.

Make a big dataframe and make the average the last 10 generation of the 21 replicates.

What is the AI

Markov brain implemented in MABE. Markov brain is recurrent neural network (finite state machine).

Refernces:

Markov:

markov brains: Hintze, A., Edlund, J. A., Olson, R. S., Knoester, D. B., Schossau, J., Albantakis, L., ... & Bohm, C. (2017). Markov brains: A technical introduction. arXiv preprint arXiv:1709.05601

https://www.mitpressjournals.org/doi/pdfplus/10.1162/isal\_a\_016

Mabe:

Bohm, C., & Hintze, A. (2017, September). MABE (modular agent based evolver): A framework for digital evolution research. In Artificial Life Conference Proceedings 14 (pp. 76-83). One Rogers Street, Cambridge, MA 02142-1209 USA journals-info@ mit. edu: MIT Press.

<https://arxiv.org/pdf/1709.05601.pdf>

From Arend Hintze to Everyone: 05:58 PM

https://en.wikipedia.org/wiki/Group\_selection

From Arend Hintze to Everyone: 06:05 PM

<https://www.mitpressjournals.org/doi/pdf/10.1162/978-0-262-32621-6-ch058>

Research gap:

Methods:

1 reinforcement learning

2 neural network (neuro) evolution

Objective function typacily apply to individual but we sometimes need colaboration.

objective function = fitness function = evaluates performance

“How do we define objective functions such that they improve the performance of the group?" obvious answer: Group level (clone) selection. (read the wiki page)

However, what would happen if we have minimum, maximum and individual.

Publication link:

<https://www.robot100.cz/alife2021>

Question: What is genetic algorith?

a GA implements the mechanism of inheritance, variation, and selection

a GA is an instance of evolution

<https://link.springer.com/article/10.1007/s00521-020-04832-8>

Start point iz 0 0

Directions: o up, 1 right, 2 bottom, 3 left

E is number of grass he gathered

A is actoin: 0 do nothing, 1 turn left, 2 turn right, 3 move forward, 4,5,6,7 trying to give pice of food to agent or tile.

B if they beep. 0 not any other numbe beeping

Proof of darwin

<http://plaza.ufl.edu/johncad/evolution/origin%20of%20complex%20features.pdf>

<https://d1wqtxts1xzle7.cloudfront.net/49011047/Long-Term_Dynamics_of_Adaptation_in_Asex20160921-3310-7wjoic.pdf?1474461648=&response-content-disposition=inline%3B+filename%3DLong_term_dynamics_of_adaptation_in_asex.pdf&Expires=1605626618&Signature=Ces54fs0PFibETux-gftRB~zKX-gwnUy09ysyGaESckdznarrUsLu3zTNwNDKLyo72OvRotF0pxiucL8aBlanMOv35-zvMNELK~z1ktVopMO8C~G3EwVq4HRWWp5ODCplpEdyGc15CCPz5ALyxiJ16TswaD8lUIDkk3bp6z04hOqkuTcAJhjLLCeOjN5MoYQjLQnvx6UralIjXONyv4pz0roWrSdffNuQ8iBPC3R5I1n2q8LtrZmRq09nhtgOOzTYCD0TCjiPz3Y2fv8gTG6sWEp1L42IJGSBLMl0ysbwYWc9hU0M3LG4UlvK6RG5g6wxWDw9RHqIn3LOw2S7ij8SA__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA>

Questoin: Using text from original propsal in the final report?

Question: type of references? IEEE

Question: In lod analyzer I have added all the replicates of each condition together and

calculated the mean of minimum, maximum, sum and averages. But, in movement analyzer I have calculated the percentage of each flage (like beep) and then mean of all the replicates of each condition. So, unlike lod in movement the files are NOT added. Is it correct approach?

|  |  |
| --- | --- |
| Analyzer type | Add or conceret all the repicates of each condition |
| lod | yes |
| movement | no |
| beep | yes |

Significant test

<https://en.wikipedia.org/wiki/Kolmogorov%E2%80%93Smirnov_test>

<https://en.wikipedia.org/wiki/Mann%E2%80%93Whitney_U_test>

<https://docs.scipy.org/doc/scipy/reference/generated/scipy.stats.mannwhitneyu.html>

mannwhitneyu(beep100,mute100)

36.46 \* (p=0.001232)

if value < 0.01

Annette Lenne

Question: what should we discuss in disucussion section?

Repeat the quesiton and make a summary of results. Yes but, .... (there is no such things like cheating), and also other type of thinkings.

The last sentence of conclusion should be very well.

Deep learning and nural network

fellowship

PhD program

openAI.org

ueberAI

<https://www.mpg.de/jobboard>

Q any simple implementation of neural network using C++

Q references for evelotion?

<https://www.du.se/sv/om-oss/jobba-hos-oss/vara-lediga-jobb/>

https://towardsdatascience.com/how-to-compare-two-distributions-in-practice-8c676904a285

in python:

https://docs.scipy.org/doc/scipy/reference/generated/scipy.stats.ks\_2samp.html