Evolution Simulation

Simon Poschenrieder

15.06.2020

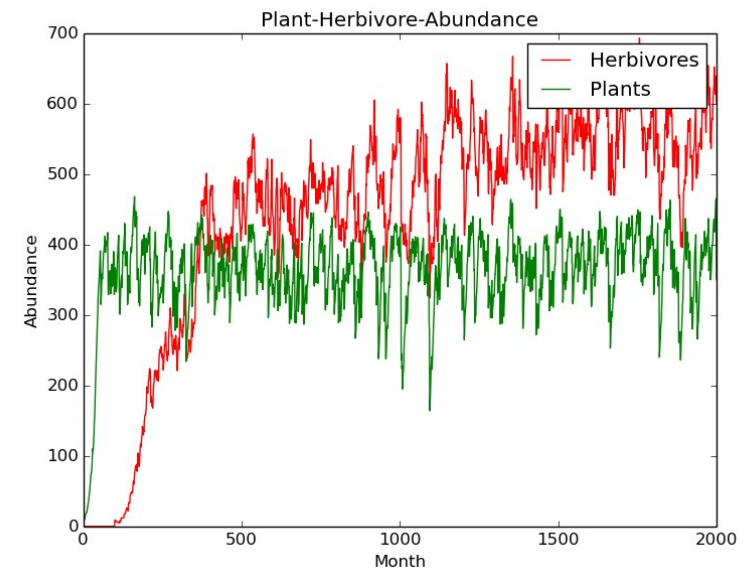# Simulation
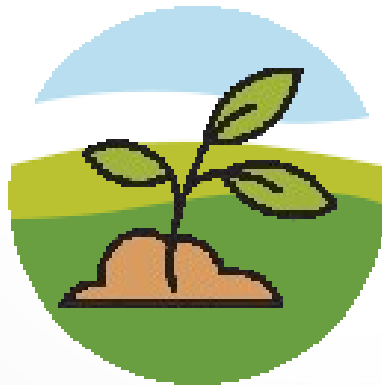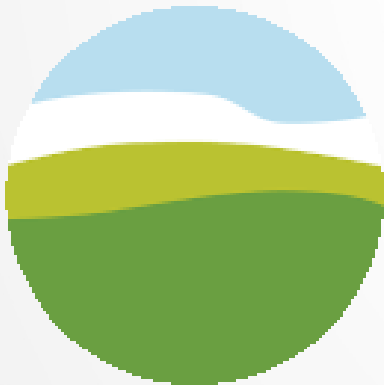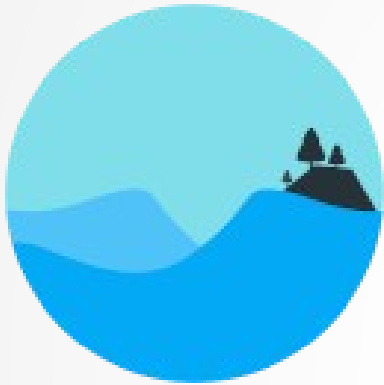
Some Important Properties

Herbivore

QualityOfSense
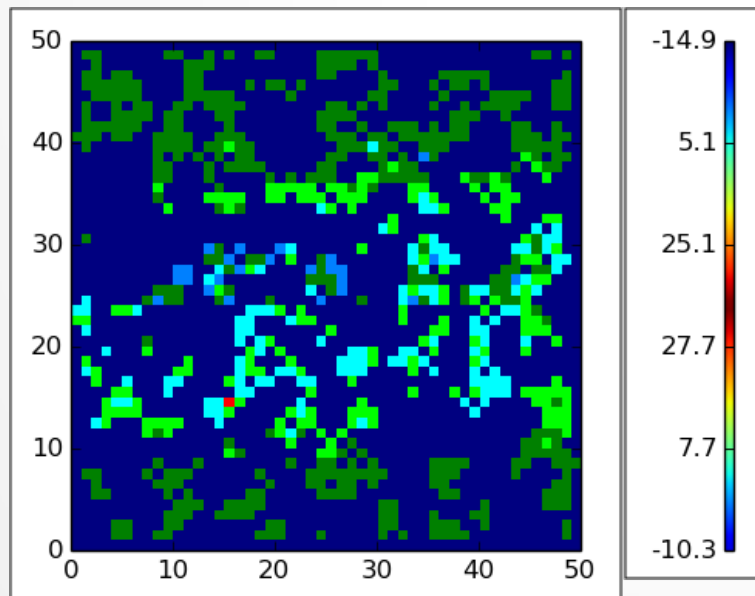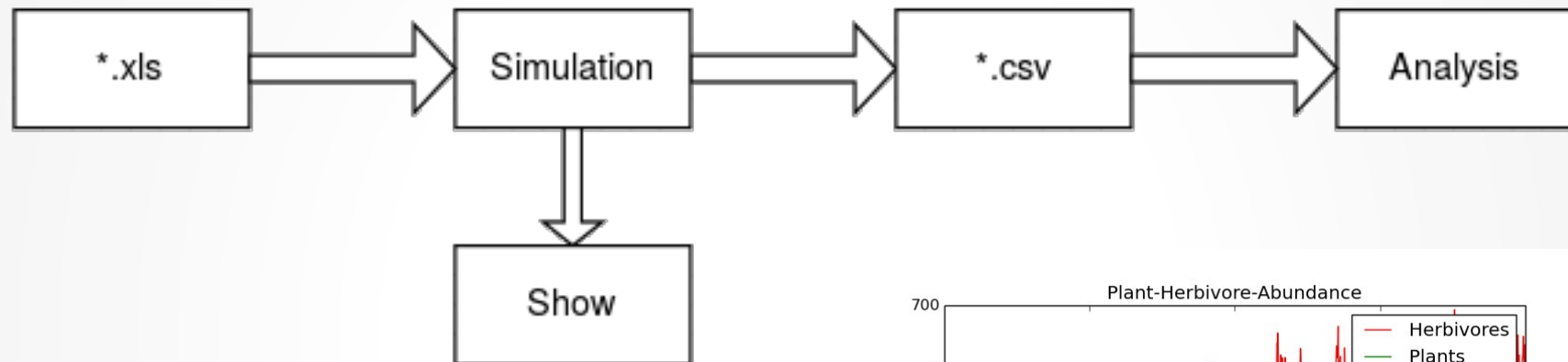ChildProductionFactor
Hunger
Age
DefenseFactor
FavoriteTemperature
TemperatureSpan
…

Plant

SeedProdFactor
SeedLightness
Age
FoodChunks
DefenseFactor
FavoriteTemperature
TemperatureSpan
MaxWaterDistance
PhyloName
…

Initial Process

Finding the Balance

- Problem:

Extinction of all plants (or herbivore)
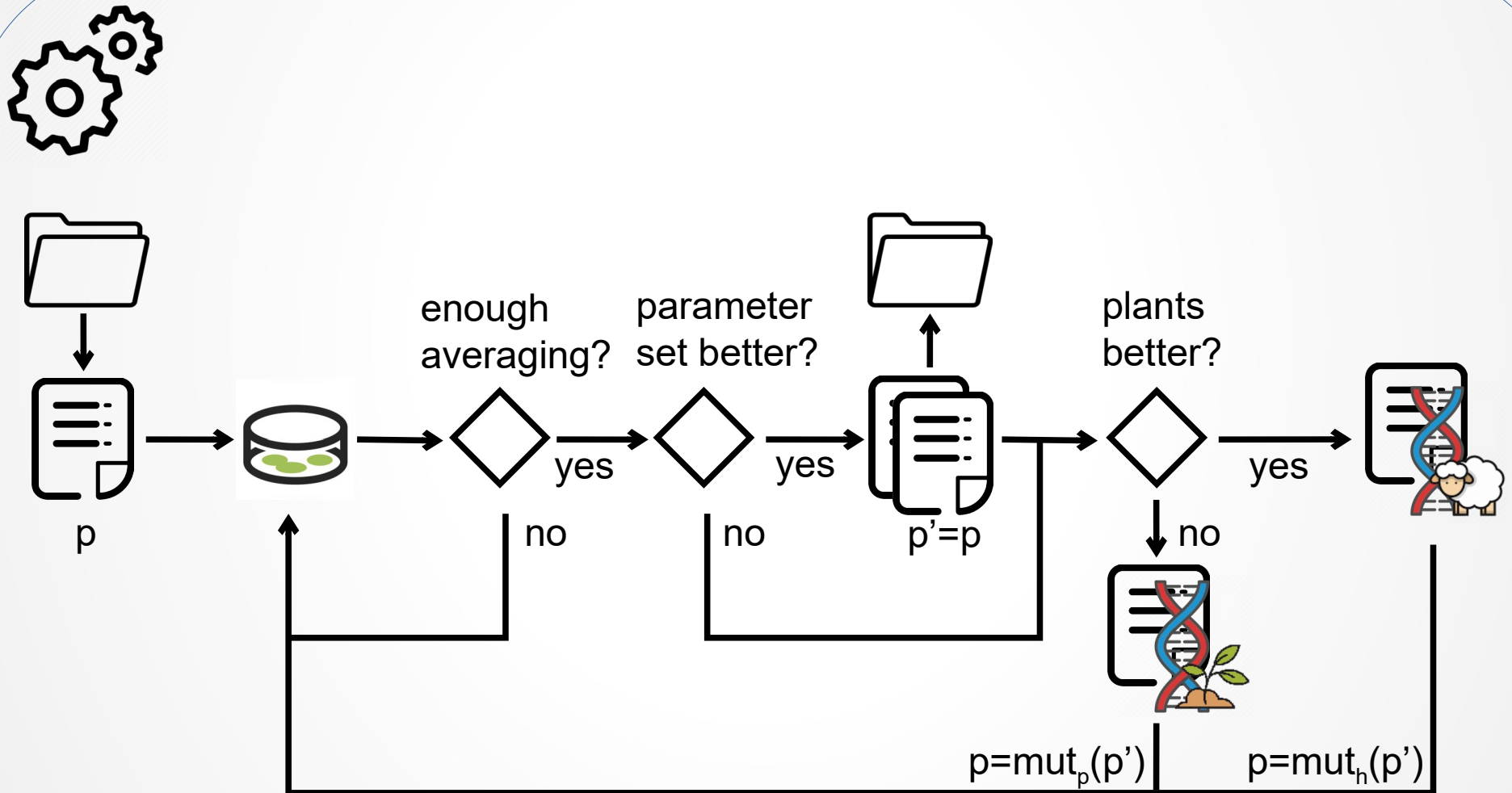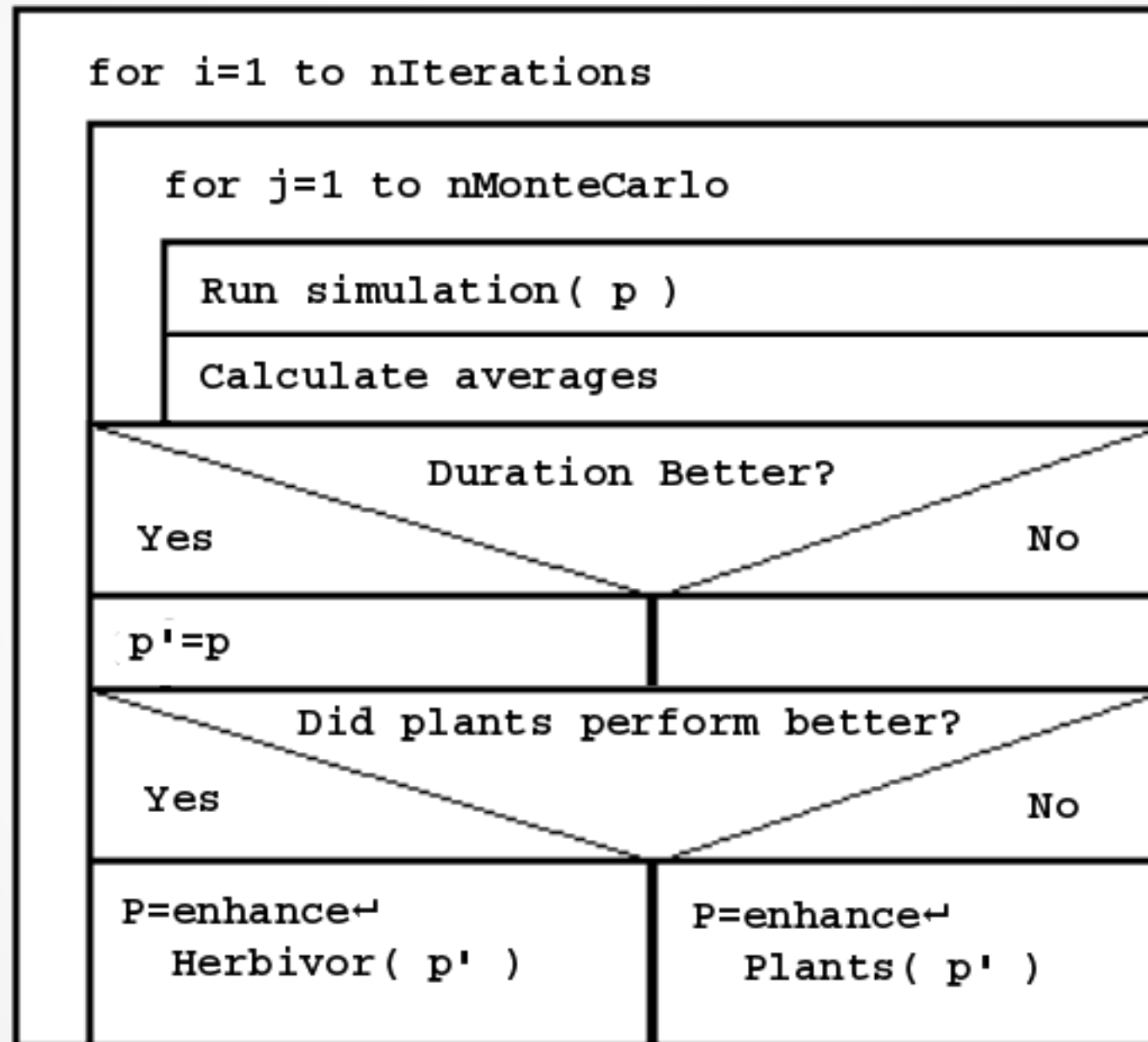How to fine tune?

- Solution:

Many properties as parameter
1+1 Evolutionary algorithm

Shell Script

enough averaging?

parameter set better?

plants better?

yes

yes

yes

no

no

no

p

p'=p

$p=mut_p(p')$

$p=mut_h(p')$

Shell Script Structure Chart

```
for i=1 to nIterations

    for j=1 to nMonteCarlo

        Run simulation( p )

        Calculate averages

                    Duration Better?
    Yes                                          No

    p'=p

                Did plants perform better?
    Yes                                          No

    P=enhance↵                        P=enhance↵
      Herbivor( p' )                    Plants( p' )
```

Simulation from Python to C++

- Python: no types; C++: strongly typed

- Python output wasn't ported

- To be done, speed comparison

- Open many new opportunities

Outlook

- CUDA or OpenCL → Compare Performance

- Add Carnivore

- Add OpenGI Interface