Genetic Algorithm - Tarea 2

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02/11/2020

Tarea 2

Tarea 2 consists in giving

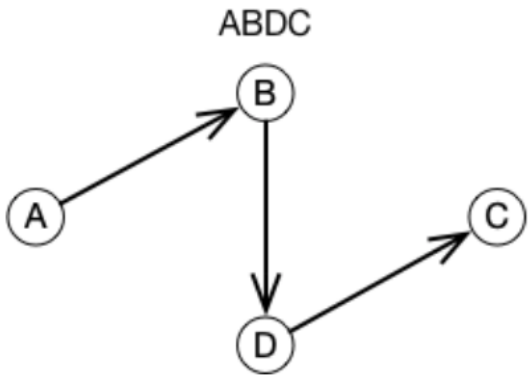
- your implementation of a genetic algorithm in your favorite language
- A way to obtain graphics of the fitness function
- Example provided in the lectures (finding a word, converting a number of a binary)
- A larger application
- short reports showing the impact of hyper parameters and the description of your topic

These slides give a number of ideas for the larger application

You can either (i) propose a topic (you need to do beforehand) or (ii) pick a topic in the next few slides

Traveling salesman problem

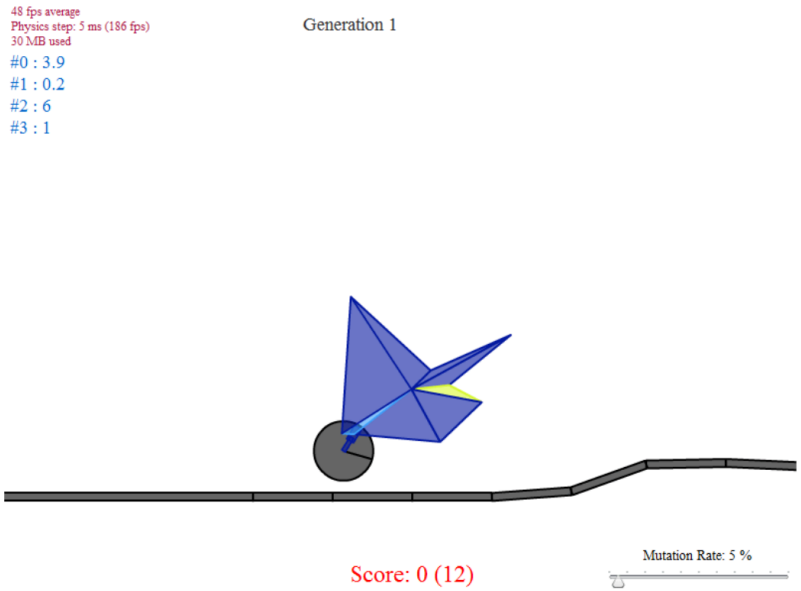
In this topic, you should provide a way to generate a random distribution of cities, and your algorithm must give the shortest solution



Modeling a car

Finding a combination of parameters that makes a car moving

http://boxcar2d.com/about.html



Modeling living organisms

https://www.youtube.com/watch?v=bBt0imn77Zg

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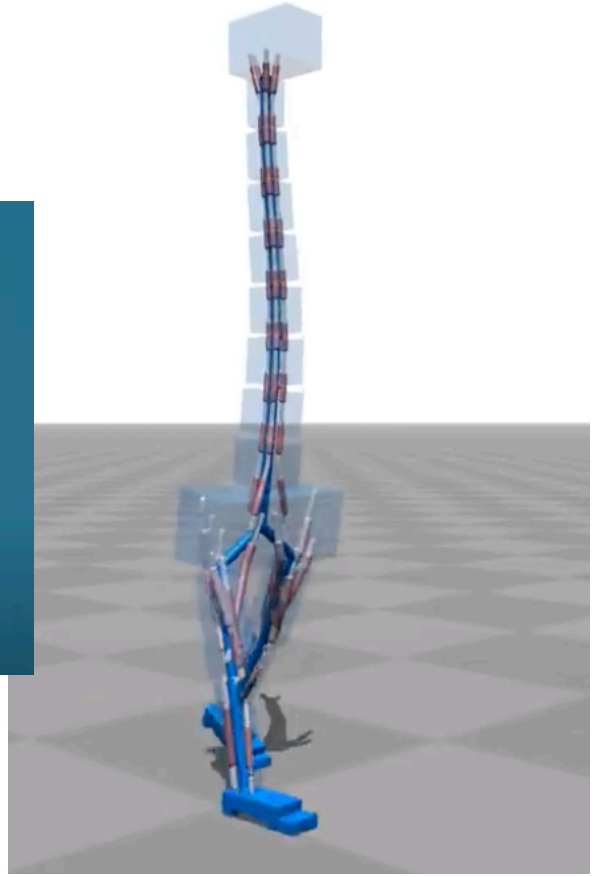
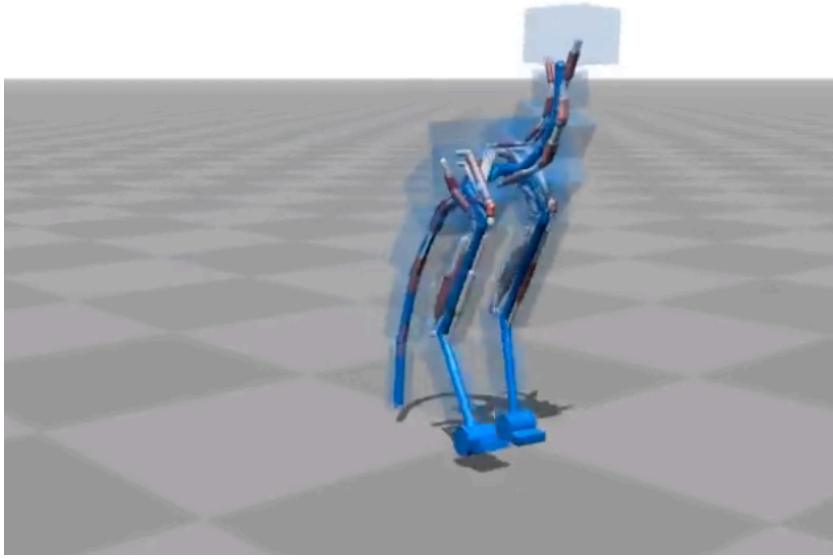
https://www.youtube.com/watch?v=pgaEE27nsQw

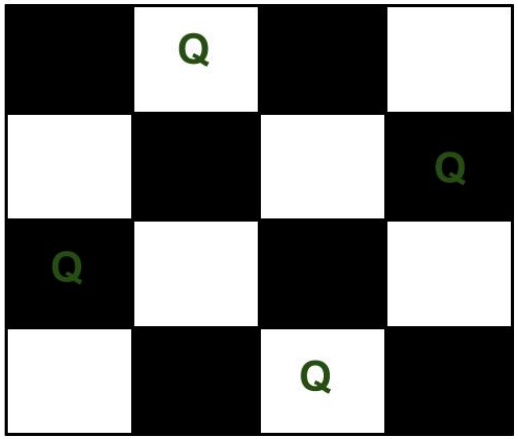




N-queen

The N-queen problem is a famous algorithmic problem that consist in placing N-queen on an NxN chess board such that no queens attack each other.

Example of locating 4 queen on a 4x4 board



Applying GA to video games

To find bugs, errors, or the best combination to finish a level in a game

To read:

Reproducing Bugs in Video Games using Genetic Algorithms

http://bergel.eu/MyPapers/Ahum20a-GMAX-GeneticAlgorithmInGames.pdf

Software engineering

Using GA in software engineering is a very large area

For example, if you have a function `f(x1, x2, x3)`

what are the values of x1, x2, x3 which makes the memory consumption very high. If you find one, then you have probably found a bug

Another topic could be, assuming you have a library with many functions `f1, f2, f3, f4, …`

what is the sequence of the function that can maximize a resource consumption (CPU, memory, …)

Pick a topic

And let us know.

Some of these topics are complex, and do not need to be finished to have a 7

Discuss with us!

Deadline will be in about two or three weeks